

**UNITED STATES AIR FORCE  
ARMSTRONG LABORATORY**

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**Demonstration of Radio-Frequency Soil  
Decontamination: KAI Technologies  
Demonstration (Volume III of III) Part 2:  
Pages 230-360**

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**December 1996**



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*Approved for public release; distribution is unlimited.*

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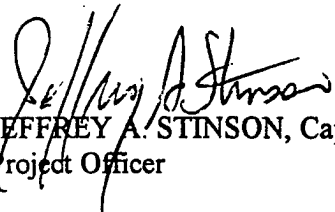
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This report has been reviewed and is approved for publication.

  
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# DRAFT SF 298

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<b>14. Abstract</b> The Air Force Armstrong Laboratory, Tyndall Air Force Base, Florida, has supported the research and development of Radio Frequency Soil Decontamination. Radio frequency soil decontamination is essentially a heat-assisted soil vapor extraction process. Site S-1 at Kelly Air Force Base, Texas, was selected for the demonstration of two patented techniques. The site is a former sump that collected spills and surface runoff from a waste petroleum, oils, and lubricants and solvent storage and transfer area. In 1993, a technique developed by the ITT Research Institute using an array of electrodes placed in the soil was demonstrated. In 1994, a technique developed by KAI Technologies, Inc. using a single applicator placed in a vertical borehole was demonstrated. Approximately 120 tons of soil were heated during each demonstration to a temperature of about 150 degrees Celsius.						
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## **PREFACE**

This report was prepared by Halliburton NUS Environmental Corporation, 800 Oak Ridge Turnpike, Oak Ridge, TN 37830 under contract F33615-90-D-4011 for the Armstrong Laboratory Environics Directorate (AL/EQW) (formerly the Air Force Engineering and Services Center), Tyndall AFB, FL 32403-5323.

This final report summarizes the project's Phase I efforts for a field demonstration of the IIT Research Institute's (IITRI) tri-plate capacitor and the KAI Technologies, Inc.'s (KAI) antenna radio frequency heating (RFH) techniques for the enhancement of soil vapor extraction (SVE) for the in situ decontamination of soils.

The work was performed between June 1992 and December 1994. The AL/EQW technical project officers were Mr. Paul F. Carpenter (during the initial stage of the project) and Capt Jeffrey A. Stinson (during the latter stage of the project).

## EXECUTIVE SUMMARY

The United States Air Force developed the Installation Restoration Program to assess past hazardous waste disposal and spill sites and prepare remedial actions consistent with the National Contingency Plan for those sites that pose a threat to human health or the environment. Within that program the Site Remediation Division of the Environics Directorate of the Air Force's Armstrong Laboratory at Tyndall AFB, Florida, has supported the research and development of Radio Frequency Soil Decontamination.

Armstrong Laboratory was sufficiently encouraged by the early test results in sandy soils at Tyndall AFB, Florida, and Volk Field, Wisconsin, to pursue larger-scale demonstrations in tight soils that are more difficult to treat. In September 1991, the Air Force Center for Environmental Excellence at Brooks AFB, Texas, contracted Halliburton NUS Environmental Corporation (now Brown & Root Environmental) to conduct pilot scale demonstrations of two different, patented, radio frequency heating techniques at Site S-1 at Kelly AFB, Texas.

The project was divided into three phases the Preplanning Phase, Phase I, and Phase II. The Preplanning Phase, completed in September 1992, included literature review, conceptual cost estimations, design plans and specifications preparation and review, and publication of a final report documenting the results. Phase I included two integrated pilot tests and the preparation of this final technical report evaluating the results of Phase I and the conceptual planning of Phase II. Phase II will include the complete planning and design of a full-scale commercial demonstration of radio frequency soil decontamination.

Radio frequency soil decontamination is essentially a heat-assisted vapor extraction process. Radio frequency energy applied to the soil causes polar molecules, including water and many organic compounds, to vibrate. This vibrational energy is lost as heat. The resulting rise in soil temperature vaporizes both water and contaminants, which may then be removed by application of a vacuum. Extracted vapors may be treated by a variety of methods, depending on the site and the nature of the contaminants. Vapors extracted during the demonstrations at Site S-1 were burned in a flare.

Two types of radio frequency soil heating were demonstrated at Site S-1 from January to August 1993 and 1994. In 1993, a technique developed by the IIT Research Institute that uses a series of exciter and ground electrodes placed in the soil was demonstrated. This technique was tested previously at Air Force sites. In 1994, a technique developed by KAI Technologies, Inc. which uses

an antenna-like device that may be placed in a vertical or horizontal borehole was demonstrated. Halliburton NUS Environmental Corporation provided site preparation services, the vapor extraction system, and supervised and coordinated all other aspects of the demonstrations.

Armstrong Laboratory, Kelly AFB, and the US Department of Energy have contributed funds and guidance for the work completed to date which includes the Preplanning Phase and Phase I. In addition, the Phase I demonstrations are part of the US Environmental Protection Agency's Superfund Innovative Technology Evaluation Program.

Halliburton NUS Environmental Corporation concludes that data gathered during the pilot demonstrations is invaluable to the development of radio frequency heating for the enhancement of soil vapor extraction and can be used to design a commercial scale system and implement remedial activities in accordance with United States Air Force procedures. From lessons learned during the Site S-1 demonstrations, criteria for technology implementation have become apparent that allow the selection of a site better suited to the unique physical and chemical phenomenon inherent in the process. To date only six field tests have been completed. These tests have addressed situations with a wide variance of soil and contaminant characteristics. A phased approach is recommended which would include more demonstrations to plug data gaps and define unknowns followed by commercial scale application. A smaller site with a simpler (more homogenous) soil and contaminant matrix, relative to Site S-1, would simplify the evaluation of results and better define technology applicability.

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## FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT RF Heating BORING NO. F3  
 JOB NO. 3688 LOGGED BY: BDH  
 PROJ. MGR. CFB EDITED BY:  
 DRILLING COMPANY: SST  
 DRILL RIG TYPE: Mobile B-53  
 DRILLING METHOD: Hollow stem Auger 4 1/4" ID  
 DRILLERS NAME: John Talbot  
 TOTAL DEPTH (FT.) 23  
 TIME STARTED 1215 DATE 1/15/94  
 TIME COMPLETED 1306 DATE 1/15/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED. DATE

WEATHER CONDITIONS

Partly Cloudy, upper 60°F, moderate east wind

SURFACE ELEVATION

COMMENTS

Gravel

4-6 Clay, slightly silty, w/ gravel, concrete frags, dry to sl. moist, FILL

#2 liner - regular

SAMPLER TYPE  
 FEET DRIVEN  
 FEET RECOVERED  
 SAMPLE CONDITION  
 FIELD LABORATORY SAMPLE NUMBER  
 FIXED LABORATORY SAMPLE NUMBER  
 HRT SCAN  
 (PPM)  
 LITHOLOGIC CODE  
 DEPTH (FEET)

1  
2  
3  
4  
5  
6  
7  
8  
9

3 SP 2.0 1.5 Good KRF-F3 40406 0 221



# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Testing

F2

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4 1/2" ID

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.): 27.5

TIME STARTED 0958

DATE 1/15/94

TIME COMPLETED 1110

DATE 1/15/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, to 60°F, light east wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE  
FEET DRIVEN  
FEET RECOVERED  
SAMPLE CONDITION  
FIELD LABORATORY SAMPLE NUMBER  
FIXED LABORATORY SAMPLE NUMBER  
HNU SCAN (PPM)  
LITHOLOGIC CODE  
DEPTH (FEET)

1  
2  
3  
4  
5  
6  
7  
8  
9

Gravel



SHEET 1 OF 2

PROJECT

**BORING NO.**

F

**JOB NO.** 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile 8-53

DRILLING METHOD: Hollow Stem Auger  $4\frac{1}{4}"$  ID

DRILLERS NAME: John T. Elliott

TOTAL DEPTH (FT.) 23

TIME STARTED 0814

DATE 1/15/94

TIME COMPLETED 0937

DATE 1/15/94

**GROUND-WATER CONDITION AT  
COMPLETION OF DRILLING**

Not

## BACKFILLED, TIME

DATE \_\_\_\_\_

### WEATHER CONDITIONS

Partly cloudy, upper 30°F, slight NW wind

**SURFACE  
ELEVATION**

## COMMENTS

SAMPLER	TYPE	FEET	DRIVEN	FEET	RECOVERED	SAMPLE	CONDITION	FIELD LABORATORY	SAMPLE NUMBER	FIXED LABORATORY	SAMPLE NUMBER	HAND SCAN	(PPM)	DOVA	LITHOLOGIC	CODE	DEPTH	(FEET)
---------	------	------	--------	------	-----------	--------	-----------	------------------	---------------	------------------	---------------	-----------	-------	------	------------	------	-------	--------

3" 59 1.5 0.7

44-38861-10706  
2822 4

4.5.5' Clay, silty, w/ gravel, wood fragments,  
sh. lvs, roots, FILL  
#1 liner - random

75 blows for 1.5' driven, driller  
reports on zone



# FIELD LOG OF BORING

SHEET 1 OF 2

## PLAN

PROJECT

**BORING NO.**

RF Hastings

E 8

JOB NO. 3688

LOGGED BY: GDIH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger  $4\frac{1}{4}$ "

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 28

TIME

TIME STARTED 0925

DATE \_\_\_\_\_

DATE 1/18/94

TIME

TIME COMPLETED 105

DATE \_\_\_\_\_

DATE 11/18/94

**GROUND-WATER CONDITION AT COMPLETION OF DRILLING**

Wet, water at ~ 25'

**BACKFILLED.**

DATE \_\_\_\_\_

## TIME

### WEATHER CONDITIONS

Partly cloudy, to 40°F, strong NE wind, gusty  
SURFACE

**SURFACE**

## ELEVATION

## COMMENTS

SAMPLER	
TYPE	
FEET	
DRIVEN	
FEET	
RECOVERED	
SAMPLE	
CONDITION	
FIELD LABORATORY	
SAMPLE NUMBER	
FIXED LABORATORY	
SAMPLE NUMBER	
HRU SCAN	07A
(PPM)	
LITHOLOGIC	
CODE	
DEPTH	
(FEET)	



## FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E7

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 14

TIME STARTED 1600

DATE 1/13/94

TIME COMPLETED 1645

DATE 1/13/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, upper 60's, NE wind

SURFACE ELEVATION

COMMENTS

Gravel at surface

2'-4' Clay, silty, w/gravel, light br to red br, moist

#2 liner - regular

SAMPLER TYPE  
FEET DRIVEN  
FEET RECOVERED  
SAMPLE CONDITION  
FIELD LABORATORY SAMPLE NUMBER  
FIXED LABORATORY SAMPLE NUMBER  
HND SCAN OVA (PPM)  
LITHOLOGIC CODE  
DEPTH (FEET)

3"	20	1.6	Good	17RF-E7-40204	32	1604	1
							2
							3
							4
							5
							6
							7
							8
							9
							10



# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

E6

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: John Tallon

TOTAL DEPTH (FT.) 22

TIME STARTED 1350

DATE 1/14/94

TIME COMPLETED 1443

DATE 1/14/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Fair, upper 60°F, mod. SW wind

SURFACE ELEVATION

COMMENTS

Gravel

SAMPLER TYPE

FEET

DRIVEN

FEET

RECOVERED

SAMPLE

CONDITION

FIELD LABORATORY

SAMPLE NUMBER

FIXED LABORATORY

SAMPLE NUMBER

HEAVY SCAN DVA

(PPM)

LITHOLOGIC

CODE

DEPTH (FEET)

3"

SP

2.0

1.9

Good

KRF-E6-40810

2

1358

235

10

Clay, silty, sdy, w/ gravel, silt br, moist, FILL

#2 liner - regular





# FIELD LOG OF BORING

SHEET 1 OF 2

ELAN

PROJECT

**BORING NC.**

## RF Heating

E5

JOB NO. 3688

LOGGED BY: BDIH

PRCJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: *mobile* B-53

**DRILLING METHOD:** *Hollow Stem Auger 4 1/4"*

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 22

TIME STARTED 1355

DATE 1/17/94

TIME COMPLETED 1523

DATE 1/17/94

### GROUND-WATER CONDITION AT COMPLETION OF DRILLING

## BACKFILLED, TIME

DATE \_\_\_\_\_

**WEATHER CONDITIONS**

Partly cloudy, upper 50's F, strong NE wind

**SURFACE  
ELEVATION**

## COMMENTS

SAMPLER	
TYPE	
FEET	
DRIVEN	
FEET	
RECOVERED	
SAMPLE	
CONDITION	
FIELD LABORATORY	
SAMPLE NUMBER	
FIXED LABORATORY	
SAMPLE NUMBER	
HNU SCAN	
(PPM)	
LITHOLOGIC	
CODE	
DEPTH	
(FEET)	

35P 2.0

1.7

Good

4

1404

3'' sp

20

1.2

Good

14

1408

4'-6' (brgy, sandy, silty, w/ gravel, med.  
brn to dk brn, dry) filter fabric, wire  
FILL

H2 line - result

6'-8' same as 4'-6'

#2 liver - regains



SHEET: 1 OF 2

**BORING NO.**

E4

LOGGED BY: BDH

**EDITED BY:**

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobil 2 B-53

DRILLING METHOD: *Hollow Stem Auger 4 1/4" ID*

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 24

TIME STARTED 1006

DATE 1/17/44

TIME COMPLETED 1208

DATE 11/17/94

### GROUND-WATER CONDITION AT COMPLETION OF DRILLING

## BACKFILLED, TIME

DATE \_\_\_\_\_

### WEATHER CONDITIONS

Partly Cloudy, to 50°F, strong 15-20 mph N wind  
**SURFACE**

**SURFACE  
ELEVATION**

## COMMENTS

Gravel at sfc

3' Large gravel or coarse

6'-7' On hard obstruction, cannot  
drive split spoon, use wedge  
and downhole hammer to break  
through obstruction, no sample due  
to poor recovery

7'-9' clay, s/s / sand, gravel, med.  
br, slight hydrocarbon odor

SAMPLER	
TYPE	
FEET	
DRIVEN	
FEET	
RECOVERED	
SAMPLE	
CONDITION	
FIELD LABORATORY	
SAMPLE NUMBER	
FIXED LABORATORY	
SAMPLE NUMBER	
TRU SCAN	07A
(PPM)	
LITHOLOGIC	
CODE	
DEPTH	
(FEET)	

Hand-drawn geological cross-section on a grid. The vertical axis on the right is labeled 1 through 9. The horizontal axis at the bottom is labeled 1 through 9. The section shows a wavy line representing a geological boundary. Above the line, from left to right, are labels: '1' GP 2.0', '0.3 Poor', '1055', and '0'. Below the line, from left to right, are labels: '2.0 Good', 'KRF-E446709', and '1055 32'. A small '8' is written near the center of the wavy line.



**HALLIBURTON NUS**  
Environmental Corporation

## FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E3

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4 1/4" ID

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 29.0

TIME STARTED 1542

DATE 1/17/94

TIME COMPLETED 1754

DATE 1/17/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Wet

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, mid 60°F, strong NE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE  
FEET DRIVEN  
FEET RECOVERED  
SAMPLE CONDITION  
FIELD LABORATORY SAMPLE NUMBER  
FIXED LABORATORY SAMPLE NUMBER  
HNU SCAN (PPM)  
LITHOLOGIC CODE  
DEPTH (FEET)

1

2

3

4

5

6

7

8

9



# FIELD LOG OF BORING

SHEET: 1 OF 2

## PLAN

# PROJECT

**BORING NO.**

RF Nesting

F2

JOB NO. 36880

LOGGED BY: BDH

PROJ. MGR. CFB

**EDITED BY:**

**DRILLING COMPANY:** SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger  $4\frac{1}{4}$ "

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 28.0

TIME STARTED 1228

DATE 1/18/94

TIME COMPLETED 1402

DATE 1/18/94

### GROUND-WATER CONDITION AT COMPLETION OF DRILLING

## BACKFILLED, TIME

DATE \_\_\_\_\_

## WEATHER CONDITIONS

## SURFACE ELEVATION

## COMMENTS

0' - 0.3' Gravel, silty, light br

0.3' - 2.0' silt, clayey, w/ gravel.

2" chunk of asphalt in shoe, db. br.  
dry, FILL

#1<sup>0</sup> liver - regular

SAMPLER  
TYPE  
FEET  
DRIVEN  
FEET  
RECOVERED  
SAMPLE  
CONDITION  
FIELD LABORATORY  
SAMPLE NUMBER  
FIXED LABORATORY  
SAMPLE NUMBER  
H<sup>2</sup>O SCAN  
(PPM)  
LITHOLOGIC  
CODE  
DEPTH  
(FEET)

3  
SP

2.0

1.0

Fair

KRF-E2-40002  
1233 8

239

# FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E1

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 24.6

TIME STARTED 0804

DATE 1/14/94

TIME COMPLETED 1100

DATE 1/14/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Fair, sunny 30°F, slight breeze

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HMU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	2.0	Good		HMU-E1-40002	HMU 1100?		1
						0816		2
								3
								4
								5
								6
								7
								8
								9
								10
								11
								12
								13
								14
								15
								16
								17
								18
								19
								20
								21
								22
								23
								24



# HALLIBURTON NUS

Environmental Corporation

## FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

A2

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 6 1/4" ID

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 27.2

TIME STARTED 1009

DATE 1/12/94

TIME COMPLETED 1225

DATE 1/12/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Overcast, upper 50s°F, NE wind - moderate

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE  
FEET DRIVEN  
FEET RECOVERED  
SAMPLE CONDITION  
FIELD LABORATORY SAMPLE NUMBER  
FIXED LABORATORY SAMPLE NUMBER  
HAW SCAN (PPM) OVA  
LITHOLOGIC CODE  
DEPTH (FEET)

3"	SP	2.0	1.5	Good	KRF-A2-40002	5		1
3"	SP	2.0	1.5	Good	KRF-A2-40204	0		2
3"	SP	2.0	0.9	Good	KRF-A2-40406	0		3
								4
								5
								6
								7
								8
								9
								10

0'-0.5' Gravel fill  
0.5'-2.0' Fill, silt, clayey, w/ gravel, yellowish br to med. brown clay #2 liner - regular  
2'-4' Silt, clayey, plastic, w/ gravel, FILL, #2 liner - regular  
4'-6' clay, silty, w/ gravel, copper wire, metal, wood, med. br, varst. #2 liner - regular



# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

PF Heating

A1

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 28'

TIME STARTED 1630

DATE 1/11/94

TIME COMPLETED 1845

DATE 1/11/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, mid 60's, mod. wind in

SURFACE ELEVATION

COMMENTS

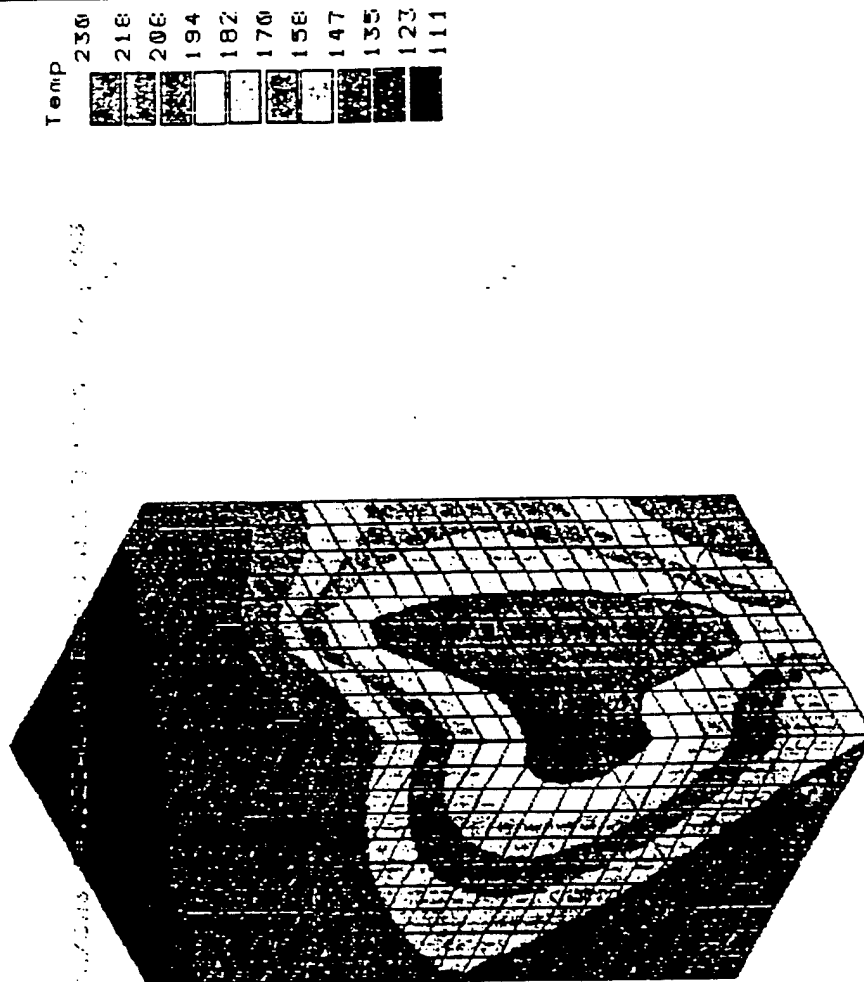
Gravel @ 28'

Fill: clay, gravelly, dark brown, dry

#1 liner for analysis

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HHH SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" GP	2	1.1	Good		1645	0		

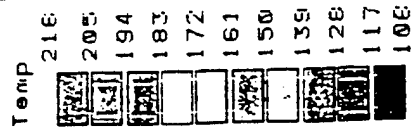
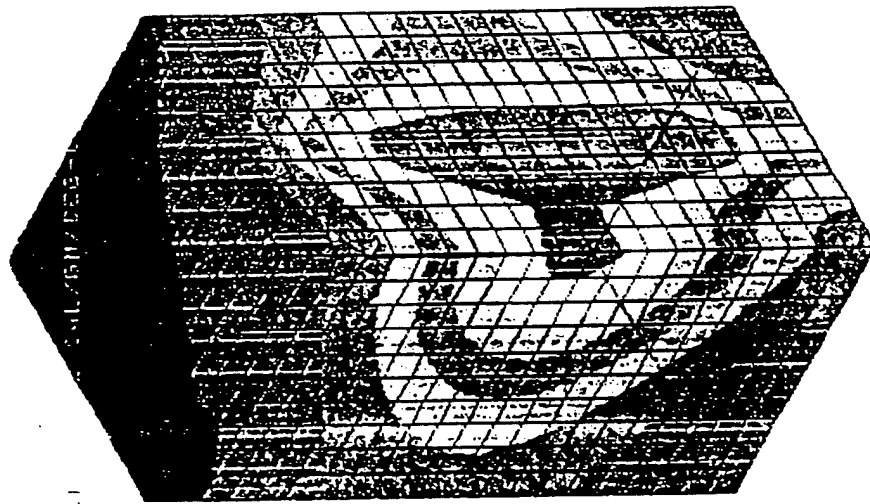
THERMAL Step=60



DBL.G15 Dual Applicators Temperature Profile - After 30 days of RF heating

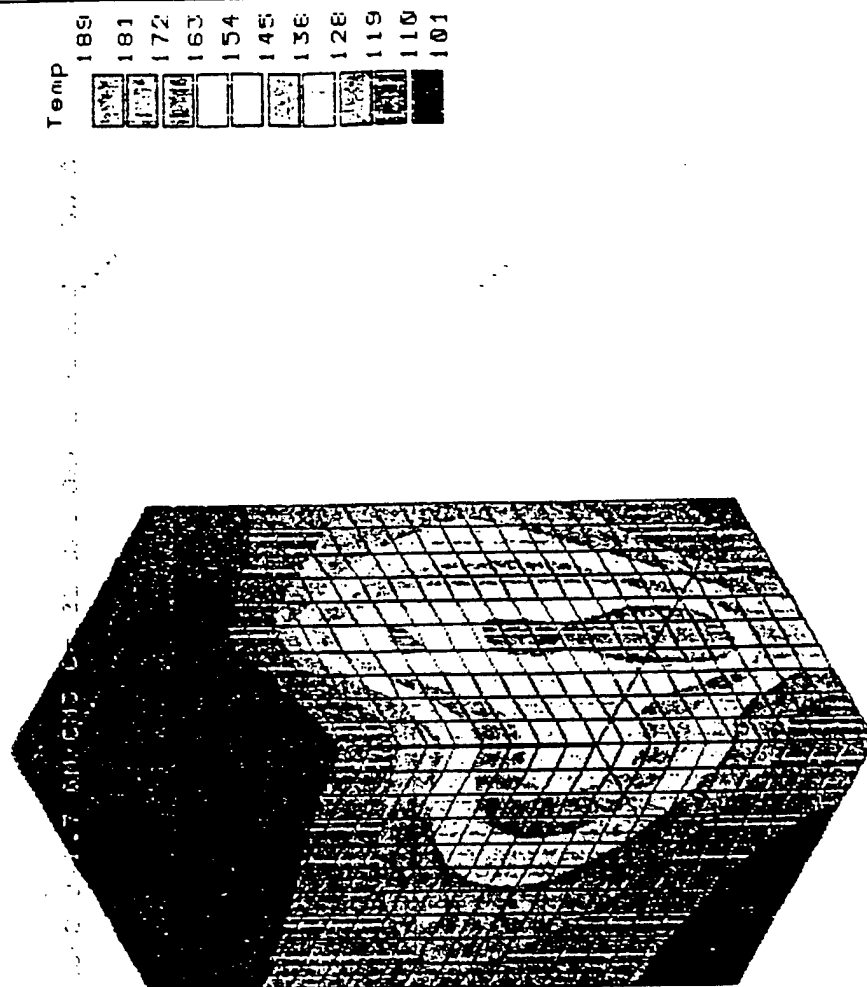


THERMAL Step=46



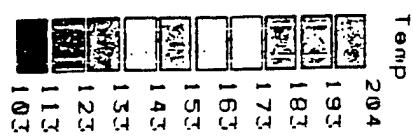
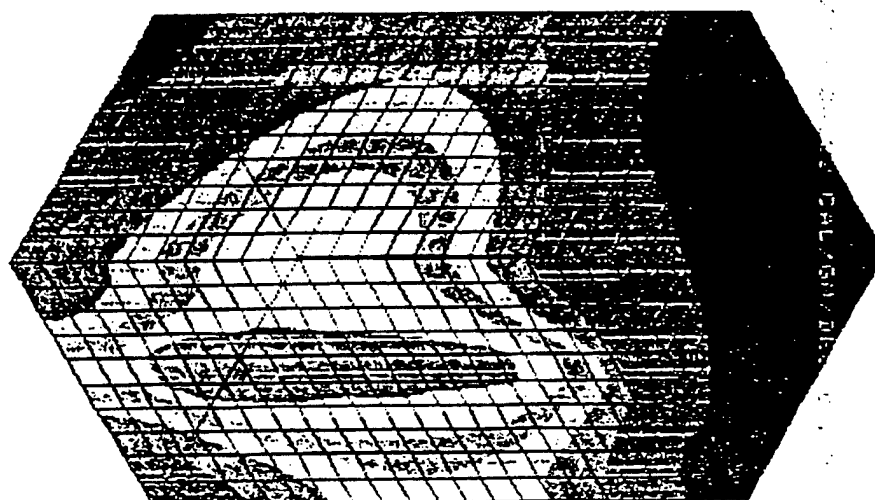
DBL.G13 Dual Applicators Temperature Profile - After 23 days of RF heating

THERMAL Step=22



DBL.G11 Dual Applicators Temperature Profile - After 11 days of RF heating

Thermal Step=34



DBL.G12 Dual Applicators Temperature Profile - After 17 days of RF heating

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.2	Good	KRF-AI-41618	1710	> 1000		1
3" SP	2.0	1.1	Good	KRF-AI-41618	1718	400		2
3" SP	0	0		KRF-AI-41728	1758	450		3
7" SP	1.1	0.9	Good					4
								5
								6
								7
								8
								9
								10
								11
								12
								13
								14
								15
								16
								17
								18
								19
								20

PROJECT RF Haly  
JOB NO. 3688

BORING NO. A1

16'-20' Clay, silty, w/ gravel med - dk br  
16'-18' FILL. Moist  
#2 liner for analysis  
#1 liner for duplicate

Moist

24' Hix gravel

No recovery @ 26', or gravel blocking sp  
100 blows for 1' recovery

27'-28' gravel, silty, yellowish br  
at top

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	DOYA	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	2.0	Good	KRF-A2-1101	1045	360		11
3" SP	2.0	2.0	Good	KRF-A2-1102	1058	80		12
								13
								14
								15
3" SP	2.0	1.8	Good	KRF-A2-1103	1107	300		16
								17
								18
								19
3" SP	2.0	1.6	Good	KRF-A2-1104	1123	420		20
								21
								22
								23
								24
								25
3" SP	1.2	1.2	Good	KRF-A2-1105	1151	>1000		26
								27
								28
								29
								30
								31
								32
								33
								34
								35
								36
								37
								38
								39
								40

PROJECT RF Heating  
JOB NO. 3688

BORING NO. A2

10'-12' Clay, dark brn, w/ minor gravel, FIL.

#2 liner - regular, #3 liner - duplicate

12'-14' Same as 10'-12'

#2 liner - regular

16'-18' Clay, silty, sandy, w/ minor gravel

dark brn, FIL, wet, #2 liner - regular

#3 liner - duplicate

20'-22.5' Same as 16'-18', sampled - #2 liner

21.5'-22' Gravel, silty, some clay, yellowish brn to tan, moist

26'-28.2' Gravel, silty, some clay, chert, yellowish brn to tan, moist

200 blows w/ 140 lb hammer for 1.2' down  
#2 liner - regular

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	SHINUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.2	Good	KRF-EI-4118	0830			11
								12
								13
								14
								15
								16
3" SP	2.0	1.7	Good	KRF-EI-4118	0846	60		17
								18
								19
								20
								1
								2
								3
								4
3" SP	0.6	0.6	Fair	KRF-EI-42425	0934			5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT

RF Blotting

BORING NO.

JOB NO. 3688

E1

10'-12' clay, silty, w/ gravel,  
dk br, moist.  
#2 liner - regular

16'-18' gravel, clayey, yellowish  
br to tan. moist w/ fuel odor,  
what appears to be for product?  
#2 liner regular  
#1 liner duplicate  
#3 liner material had slipped out  
partially therefore used #1 liner for dup

24'-24.6' gravel, silty, sl. clayey,  
yellowish br to tan, dry

NOTES:



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	THUSCAN (PPM)	LITHOLOGIC CORRE	DEPTH (FEET)	PROJECT	BORING NO.
3" SP	2.0	1.3		KRF-E2-11012	1303	84		11	RF Heating	E2
								12		
								13		
								14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
3" SP	2.0	1.8		KRF-E2-11012	1337	220		27		
								28		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

NOTES:

10-12' clay, sh. silty, w/ gravel, moist, med. brn to dk brn, FILL

#2 liner - regular

18' filler reports gravel

26'-28' gravel, clayey

#2 liner - regular



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT							BORING NO.	
KF Keating							E3	
JOB NO. 3688								
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
3" SP	2.0	1.3	Good	KRF-E3-41416	1631	600		4
								5
3" SP	2.0	1.8	Good	KRF-E3-41618	1644	38		6
								7
								8
								9
3" SP	2.0	1.2	Good	KRF-E3-42022	1657	>1000		20
								1
								2
								3
								4
								5
								6
								7
3" SP	0.9	0.9	Good	KRF-E3-42820	1774	480		8
								9
								30
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

NOTES:

14'-16' Clay, sandy, silty, w/ gravel, moist, FILL  
#2 liner - regular

16'-18' same as 14'-16' w/ wood fragments  
#2 liner - regular

20'-22' Clay, sandy, w/ gravel med. brn to dk brn, moist, soft, advent odor, FILL  
#2 liner - regular

24' Gravel

28'-29' Gravel

200 blows for 0.9' drive  
#1 liner - regular



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
3" SP	2.0	1.8	Good	KRF-E4-1104	1104	34		1	RF Heating	E4
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								20		
								1		
								2		
								3		
3" SP	2.0	1.6	Good	KRF-E4-1130	1130	600		24		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

NOTES:

9'-11' clay, sandy, silty, w/ gravel, dk br, moist at bottom, FILL

#2 liner - regular

24' Gravel

24'-26' Gravel, clayey, yellowish br, dry, solvent/fuel odor.

#2 liner - regular

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
3" SP	2.0	2.0	Good		1418	240		11	AF Heating	E 5
3" SP	2.0	2.0	Good		1426	24		12		
								13		
								14		
								15		
								16		
								17		
3" SP	2.0	1.6	Good		1441	160		18		
								19		
								20		
3" SP	2.0	1.8	Good		1454	80		21		
								22		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HRUSCAN (PPM) <sup>GRA</sup>	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
								11	RF Keating	E6
								12		
								13		
								14		
								15		
3" SP	2.0	1.6	Good	KRF-E6-416180	1410	180		16		
				KRF-E6-41618				17		
								18		
								19		
								20		
3" SP	2.0	1.6	Good	KRF-E6-42022	1420	>1000		21		
								22		
								23		
								24		
								25		
								26		
								27		
								28		
								29		
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		

NOTES:

16-18' clay, silty, w/ some gravel, wood frags., moist, fuel odor, moist, FILL  
#2 liner - reg  
#3 liner - drop.

20'-22' clay, silty, w/ some large 3" diam chert clasts, moist, fuel odor, FILL  
#2 liner - regular



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	TRUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
3" SP	2.0	2.0	Good	KRF-E7-0249	69	70		1	RF Heating	E7
								2		
								3		
								4	12'-14'	clay, silty, w/ med gravel, med br to dk br, moist
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

NOTES:



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HYDROSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT AF <i>Resting</i>	BORING NO. = 8
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								10		
								11		
								12		
								13		
								14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
								27		
								28		
								29		
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		
								41		
								42		
								43		
								44		
								45		
								46		
								47		
								48		
								49		
								50		

NOTES:

19 Miller reports gravel

24.0'-25.2' gravel, clay, yellowish brown  
wet at bottom: 200 blows for 1.2'

#2 liner - vertical

26'-28' Same as 24'-25.2', wet,  
#2 liner, solvent floor

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HAUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3"								
GP	2.0	0.8	Good	ANF-FI-1102	74	0829		11
								12
								13
								14
								15
								16
								17
								18
7"								19
GP	2.0	1.9	Good	ANF-FI-11820		>1000PPM		20
								21
								22
								23
								24
								25
								26
								27
								28
								29
								30

PROJECT

RF Heating

BORING NO.

JOB NO. 3688

F1

10'-12' Clay, silty, sandy, w/minor gravel, dk br, moist, soft, FILL

#1 liner - regular

18'-20' Gravel, clayey, dk br, wex w/ free product ~19'-20', FILL?  
Fuel o/dm from sample

#2 liner - regular

NOTES:



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

										PROJECT	BORING NO.
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	DVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)		RF Keating	
								11			
								12			
								13			
3" GP	2.0	1.6	good	KRF-F2-41416	1011	240		14			
								15			
								16			
								17			
								18			
								19			
								20			
								21			
								22			
								23			
								24			
								25			
3" GP	1.5	1.5	good	KRF-F2-42628	8001			26			
								27			
								28			
								9			
								0			
								1			
								2			
								3			
								4			
								5			
								6			
								7			
								8			
								9			
								0			

14'-16' Clay, slightly silty, w/ gravel, moist, dk brown, slight fuel odor, soft, FILL  
#2 liner - regular

24' Gravel

26'-27.5' Gravel, clayey, yellowish brown, moist, outside wet from above strong fuel / solvent odor  
#2 liner - regular  
210 blows for 1.5' driven

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANALYST	LITHOLOGIC CODE	DEPTH (FEET)
SP	20	1.5	Good	KRP-F3-4107	80	P28		11
								12
								13
								14
								15
								16
								17
								18
								19
								20
								21
								22
								3
								4
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT

BORING NO.

JOB NO. 3688

F3

10'-12' (clay, slightly silty, w/ gravel  
dk br, moist, FILL

#2 liner regular

NOTES:





# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
	2.0	0.6	Good			0		11	RF Heating	EIA
								12		
								13		
								14		
								15		
	2.0	1.2	Good			120		16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
	0.9	0.7				700		25		
								26		
								27		
								28		
								29		
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		

10'-12' Silt, clayey, w/ gravel, some asphalt sl. moist, light to red. brn #1 liner

16'-18' Silt, clayey, w/ gravel, red. brn to dk brn moist to wet in spots, white or #2 liner  
Gravel at 18'

24'-25.7' Gravel, clayey, yellowish brn, moist, strong solvent odor #1 liner

NOTES:

SHEET 2 OF 2

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF Heating										BORING NO.	
JOB NO. 3688										A1A	
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANALYST	PPM	LITHOLOGIC CODE	DEPTH (FEET)		
									11		
									12		
									13		
									14		
									15		
									16		
	2.0	0.7	Good				40		17	16-18' silt, clayey, w/ gravel, med. brn to dk brn, moist, #1 line	
							1610		18		
	2.0	0.8	Good				90		19	18-20' silt, clayey, w/ gravel, med. to dk brn, moist, #1 line	
							1616		20		
									21		
									22		
									23		
									24		
									25		
									26	200 blows for 0.7' driven	
	0.7	0.7	Good				4801		27	brown, clayey, yellowish brn, wet, solvent odor, #1 line	
									28		
									29		
									30		
									31		
									32		
									33		
									34		
									35		
									36		
									37		
									38		
									39		
									40		

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT <i>RF Nesting</i>										BORING NO.	
JOB NO. <i>3688</i>										<i>TD7 / TD8</i>	
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANUSCAN	(PPM)	LITHOLOGIC CODE	DEPTH (FEET)		
									1		
									2		
									3		
									4		
									5		
									6		
									7		
									8	<i>18' - 25' Gravel, silty, clayey, yellowish brown to tan</i>	
									9		
									0		
									1		
									2		
									3		
									4		
									5		
									6		
									7		
									8		
									9		
									0		
									1		
									2		
									3		
									4		
									5		
									6		
									7		
									8		
									9		
									0		

NOTES:



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	ANUSCAI (PPM)	LITHOLOGIC CORRE	DEPTH (FEET)	PROJECT	BORING NO.
								11	RF Heating	
								12		
								13		
								14		
3" SP	2.0	0.7	POOR	KRF-TD6-41416	1478	20		15		
								16	Clay, silty, sandy, w/ gravel, sh	
								17	br & sh soil	
								18	#1 liner	
								19		
								20		
								21		
								22		
								23		
								24		
3" SP	0.5	0			1571	180		25		
	1.5	1.9	POOR					26	200 blows for 0.5', no recovery	
				KRF-TD6-42527				27	fill on down to 25'	
								28	25-26.5' gravel, large	
								29	H 2 liner - regular	
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		

NOTES:

SHEET 2 OF 2

PROJECT AF Heating BORING NO. TD5  
JOB NO. 3688

14'-16' clay, silty, s-s gravel, dk  
brn, moist, solvent odor, FILL

#1 liner - regular  
16' Driller reports gravel

24'-24.8' gravel, coarse, yellowish  
brn, moist to wet, solvent odor.

#1 liner - regular  
270 blows for 0.8' drive

NOTES:



SHEET 1 OF 1

**BORING NO.**

TD4

LOGGED BY: BDH

EDITED BY:

DRILLING METHOD: *Hollow Stem Auger 4 1/4" ID*

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 15

TIME STARTED 1345 DATE 11/13/94

TIME COMPLETED 1425 DATE 1/13/94

**GROUND-WATER CONDITION AT  
COMPLETION OF DRILLING**

**BACKFILLED.  
TIME**

DATE \_\_\_\_\_

### WEATHER CONDITIONS

Partly Cloudy, mid 60°F, NE wind

**SURFACE ELEVATION**

## COMMENTS

gravel at the

Hand drilling at 6' and 8'



## FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

T03

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4"

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 26.0

TIME STARTED 0953

DATE 11/13/94

TIME COMPLETED 1135

DATE 11/13/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED.  
TIME

DATE

WEATHER CONDITIONS

Partly cloudy, mid 50's, mod. NE wind

SURFACE  
ELEVATION

COMMENTS

0'-1' Gravel at sfc.

1'- Gray, silty; med. to dk. brn w/ gravel, moist; #1 fines - regular

4'-1' Gray, silty; med. to dk. brn, w/ gravel, moist

SAMPLER TYPE  
FEET DRIVEN  
FEET RECOVERED  
SAMPLE CONDITION  
FIELD LABORATORY SAMPLE NUMBER  
FIXED LABORATORY SAMPLE NUMBER  
HNS SCAN (ppm)  
LITHOLOGIC CODE  
DEPTH (FEET)

3"	SP	2.0	0.7	Good	KRF-T03-41406	42	260
1							
2							
3							
4							
5							
6							
7							
8							
9							





## FIELD LOG OF BORING

SHEET 1 OF    

PLAN

PROJECT BORING NO.

RF Heating

TD1 / TD2

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Rotary Stem Auger 4 1/4" ID

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 26

TIME STARTED 1435

DATE 1/13/94

TIME COMPLETED 1541

DATE 1/13/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, upper 60°F, mod. NE wind

SURFACE ELEVATION

COMMENTS

Gravel at sfc.

Clay, silt, w/ gravel, rubber, wire, wood, FILL, moist.

SAMPLER TYPE  
FEET DRIVEN  
FEET RECOVERED  
SAMPLE CONDITION  
FIELD LABORATORY SAMPLE NUMBER  
FIXED LABORATORY SAMPLE NUMBER  
HNU SCAN (PPM)  
LITHOLOGIC CODE  
DEPTH (FEET)



HALLIBURTON NUS  
Environmental Corporation

# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF *Heating*

F5

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: *Mobile B-53*

DRILLING METHOD: *Hollow Stem Auger 4 1/2" ID*

DRILLERS NAME: *John Talbot*

TOTAL DEPTH (FT.) 24.2

TIME STARTED 0810

DATE 1/17/94

TIME COMPLETED 0950

DATE 1/17/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

*Dry*

BACKFILLED.

DATE

TIME

WEATHER CONDITIONS

*Partly cloudy, mid 40°F, strong N wind*

SURFACE ELEVATION

COMMENTS

*Ground at sfc.*

SAMPLER  
TYPE  
FEET  
DRIVEN  
FEET  
RECOVERED  
SAMPLE  
CONDITION  
FIELD LABORATORY  
SAMPLE NUMBER  
FIXED LABORATORY  
SAMPLE NUMBER  
HNU SCAN  
(PPM)  
LITHOLOGIC  
CODE  
DEPTH  
(FEET)

1  
2  
3  
4  
5  
6  
7  
8  
9



SHEET: 1 OF 2

**BORING NO.**

F4

LOGGED BY: BPH

EDITED BY:

DRILL RIG TYPE: *Mobile B-53*

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: John Tolbot

TOTAL DEPTH (FT.) 29

TIME STARTED 1454

DATE: 1/14/94

TIME COMPLETED 1646

DATE 1/14/94

GROUND-WATER CONDITION AT  
COMPLETION OF DRILLING

## BACKFILLED, TIME

DATE \_\_\_\_\_

### WEATHER CONDITIONS

Fair, upper 60°F, SW wind moderate

**SURFACE  
ELEVATION**

## COMMENTS

0 - 0. Gravel

0. - 2' clay, silty, w/ gravel,  
asphalt frags.; med. brown to dk brown

slightly moist, FILL

#2 liver - regular

SAMPLER	TYPE	FEET	DRIVEN	FEET	RECOVERED	SAMPLE	CONDITION	FIELD LABORATORY	SAMPLE NUMBER	FIXED LABORATORY	SAMPLE NUMBER	HNU SCAN	(PPM)	LITHOLOGIC	CODE	DEPTH	(FEET)
---------	------	------	--------	------	-----------	--------	-----------	------------------	---------------	------------------	---------------	----------	-------	------------	------	-------	--------

3  
SP

12.0

1.3

Good

KMF-F4-4002  
1502 2

270

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	LABORATORY (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.2	Good	KRF-F4-41214	1516	38		11
								12
								13
								14
								15
3" SP	2.0	0.6	Fair	KRF-F4-41618	1528	44		16
								17
								18
								19
								20
								21
								22
								23
								24
								25
								26
								27
3" SP	1.2	1.2		KRF-F4-42822	1604	7000		28
								29
								30
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT RF *Resting*  
JOB NO. 3688

BORING NO. F4

12'-14' Clay, sh. silty, w/ gravel, dk br, moist, FILL, some wood fragments

16'-18'

#1 liner - regular

24' Gravel, clayey, yellowish br

28'-29' Gravel, clayey, yellowish br

230 blows for 1.2' drive

NOTES:



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAT (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	0.8	Good	KRF-F5-1124	0822 22			11
3" SP	2.0	1.2	Good	KRF-F5-11618	0837 >1000			12
3" SP	2.0	1.5	Good	KRF-F5-11820	0850 550			13
3" SP	1.2	1.2	Good	KRF-F5-112324	0934 1120			14
								15
								16
								17
								18
								19
								20
								21
								22
								23
								24
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT RF Heating

BORING NO.

JOB NO. 3688

F5

12-14' Clay, silty, w/ gravel, dk brn, moist, soft, FILL

#1 liner - regular

16-18' Clay, silty, w/ gravel, dk brn, moist, soft, slight fuel odor, FILL

#2 liner - regular

18-20' Clay, silty, sandy, w/ gravel, dk brn, moist, slight fuel odor, soft, FILL

22' Hit gravel 3" block of steel  
#2 liner - regular nail

22'-24' Gravel, 200 blows for 0.3' driver, no recovery, will drill down to 23' and try again

23'-24.2' Gravel, clayey, yellowish brn to tan, dry

200 blows for 1.2' driver

#2 liner - regular

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER  
TYPE  
FEET  
DRIVEN  
FEET  
RECOVERED  
SAMPLE  
CONDITION  
FIELD LAB  
SAMPLE NO.  
FIXED LAB  
SAMPLE NO.  
HNUSCAT  
(PPM)  
LITHOLOGIC  
CODE  
DEPTH  
(FEET)

PROJECT

RF Hasting

BORING NO.

JOB NO. 3688

TD1 / TD2

1  
2  
3  
4  
5  
6  
7  
8  
9  
20  
1  
2  
3  
4  
5  
6  
7  
8  
9  
0  
1  
2  
3  
4  
5  
6  
7  
8  
9  
0

24' Gravel

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER  
TYPE  
FEET  
DRIVEN  
FEET  
RECOVERED  
SAMPLE  
CONDITION  
FIELD LAB  
SAMPLE NO  
FIXED LAB  
SAMPLE NO  
HANDSCAM  
DVA  
(PPM)  
LITHOLOGIC  
CODE  
DEPTH  
(FEET)

PROJECT  
RF Heating  
JOB NO. 3688

BORING NO.  
TD3

3"  
SP 2.0 1.8

RF-703-41416  
1024 50

3"  
SP 2.0 1.8

RF-703-42426  
1049 >1000

14'-16' Clay, silty, w/gravel, wood,  
lign, under frag., med. brn to  
dk brn, moist, FILL  
#2 liner - regular

24'-26' Gravel, clayey, yellowish  
tan, wet

#2 liner - regular  
#3 liner - duplicate

NOTES:







SHEET 1 OF 2

**BORING NO.**

TD6

LOGGED BY: BDH

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: *Mobile* *A-53*

DRILLING METHOD: *Hollow Stem Auger 4 1/4"*

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 26.5

TIME  
STARTED 1418

DATE 1/18/94

TIME COMPLETED 1543

DATE 1/18/94

### GROUND-WATER CONDITION AT COMPLETION OF DRILLING

## BACKFILLED, TIME

DATE \_\_\_\_\_

### WEATHER CONDITIONS

Partly Cloudy, mid 40°F, strong NE in gusty

**SURFACE  
ELEVATION**

## COMMENTS

—  
—  
—  
—  
—  
—

Cair

KRF-706-110106

#1 line - regular

# FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

TD7 / TD8

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: John Fabbot

TOTAL DEPTH (FT.) 25

TIME STARTED 1410

DATE 1/12/94

TIME COMPLETED 1610

DATE 1/12/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Overcast, upper 50's F, strong NE wind

SURFACE ELEVATION

COMMENTS

0'-0.5' Gravel

0.5'-18 Till, clay, silty, w/ gravel med. br to dk brown

SAMPLER TYPE  
 FEET DRIVEN  
 FEET RECOVERED  
 SAMPLE CONDITION  
 FIELD LABORATORY SAMPLE NUMBER  
 FIXED LABORATORY SAMPLE NUMBER  
 INIT SCAN (PPM)  
 LITHOLOGIC CODE  
 DEPTH (FEET)

# FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

A1A

JOB NO. 36880

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jidi

DRILL RIG TYPE: Mobile 8-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Kana

TOTAL DEPTH (FT.) 27

TIME STARTED 1526

DATE 7/11/94

TIME COMPLETED 1716

DATE 7/11/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME 1720

DATE 7/11/94

WEATHER CONDITIONS

Fair, hot, mid 90°F, light SE wind

SURFACE ELEVATION

COMMENTS

 Silt, clayey, w/ some gravel,  
 light to med. brn

Very dry

#2 liner

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	RND SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
--------------	-------------	----------------	------------------	--------------------------------	--------------------------------	----------------	-----------------	--------------

2.0 1.7 Good

22

@1543

1

2

3

4

5

6

7

8

9

# FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT <i>RF Heating</i>	BORING NO. <i>A2A</i>
JOB NO. <i>36880</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>Jedi</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow Stem Auger</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>27</i>	
TIME STARTED <i>0655</i>	DATE <i>7/13/94</i>
TIME COMPLETED <i>0916</i>	DATE <i>7/13/94</i>

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.1	Good		<i>NRF-A2A-4002</i>	34		1
						<i>@ 5706</i>		2
	2.0	0.7	Good		<i>NRF-A2A-4004</i>	12		3
						<i>@ 0712</i>		4
	2.0	1.2	Good		<i>NRF-A2A-4006</i>	<i>@ 0725</i>		5
						300		6
								7
								8
								9
								10

GROUND-WATER CONDITION AT COMPLETION OF DRILLING <i>~ 25'</i>
BACKFILLED, TIME <i>0926</i> DATE <i>7/13/94</i>
WEATHER CONDITIONS <i>Partly Cloudy, mid 70°F, SE wind</i>
SURFACE ELEVATION
COMMENTS <i>0.0' - 0.3' Sand gravel</i>
<i>0.3' - 2.0' Silt, clayey, w/ gravel, brick fragments in soil, med. bn, dry to very sl moist at bottom, #1 liner</i>
<i>Silt, clayey, w/ gravel, med bn, sl. moist, #1 liner</i>
<i>4'-6' 1st run recovered 0.3' not enough to sample, pushed spoon again</i>
<i>Silt, sl. clayey, w/ gravel, brick fragments, very dried out, grayish, sample slightly warm, #1 liner, yellowish bn to light bn.</i>

# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT <i>RF Nesting</i>	BORING NO. <i>EIA</i>
JOB NO. <i>3688</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>Jedi</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow Stem Augers</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>24.7</i>	
TIME STARTED <i>0647</i>	DATE <i>7/9/94</i>
TIME COMPLETED <i>0838</i>	DATE <i>7/9/94</i>

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	OVA	HHH SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	<i>2.0</i>	<i>1.3</i>	<i>Good</i>		<i>107F-E11-40002</i>	<i>16</i>			<i>1</i>
					<i>0708</i>				<i>2</i>
									<i>3</i>
									<i>4</i>
									<i>5</i>
									<i>6</i>
									<i>7</i>
									<i>8</i>
									<i>9</i>
									<i>10</i>

GROUND-WATER CONDITION AT COMPLETION OF DRILLING <i>moist @ 25'</i>	
BACKFILLED, TIME <i>0900</i>	DATE <i>7/9/94</i>
WEATHER CONDITIONS <i>Partly Cloudy, mid 70's F, little wind</i>	
SURFACE ELEVATION	
COMMENTS	

*0.0' - 0.2' Orange br ss (fill), gravel at sfc. fill.*

*0.2' - 2.0' Silt, clayey, w/ gravel, med. to dk br, sl. moist*

*#2 liner*



**HALLIBURTON NUS**  
Environmental Corporation

# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

RF Heating

BORING NO.

E2A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: J2di

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 26.6

TIME STARTED 0917

DATE 7/9/94

TIME COMPLETED 1025

DATE 7/9/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

~ 25'

BACKFILLED, TIME 1041

DATE 7/9/94

WEATHER CONDITIONS

Partly Cloudy, hot, upper 80°F, light SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	THW SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.2	Good		1RF-E2A-4002	2		1
					0916			2
								3
								4
								5
								6
								7
								8
								9
								10

0.0' - 0.2' orange brn sand (fill) and gravel, dry  
2.2' - 2.0' silty, clayey, w/ gravel, med. brn  
# 1 liner

APPENDIX L

PERMEABILITY CALCULATIONS

Radio Frequency Heating Decontamination Demonstration  
Site S-1, Kelly AFB

Contract No. F33615-90-D-4011  
Delivery Order No. 0007

Calculations Prepared By:

Laura H. Whitt

Date:

12/27/94

Calculations Checked By:

Date:

**PURPOSE:**

Estimate the vapor permeability of the soil at Site S-1 at several times during the demonstration of KAI's heating method.

**REFERENCES:**

Johnson, P., M. Kemblowski, and J. Cohart. Quantitative Analysis for the Cleanup of Hydrocarbon-Contaminated Soils by In-Situ Soil Venting. GROUNDWATER. 1990 May-June;28(3): 413-429.

Operating Conditions Logbook. (Data collected by Brown & Root Environmental personnel during the demonstration.)

Radian Corporation. Final Report [Vapor Stream Analysis]: Superfund Innovative Tecnology Evaluation: KAI Technologies, Inc.: Radio Frequency Heating Demonstration. Sept. 7, 1994.

Shames, Irving. Mechanics of Fluids. New York: McGraw Hill Book Company, 1982.

Subsurface pressure contours hand drawn onto Site Layout Map (Brown & Root Environmental Drawing # 3688G016.

Surface Weather Observation forms for Kelly AFB from the National Climatic Data Center (NCDC)

**ASSUMPTIONS:**

The viscosity of the vapor stream is estimated as the viscosity of air at the vapor stream temperature.

The flow rates measured by Radian Corporation during vapor sampling events are considered to be more accurate than the flow rates measured daily by Brown & Root Environmental.

The radius of influence ( $R_i$ ) is defined as the distance from the extraction wells to the 0.5"  $H_2O$  subsurface pressure contour.  $R_i$  for these calculations was estimated based on the contours in the heated area.

Screened length for all extraction wells is 9 feet.

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	THUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
	2.0	1.1	Good	KRF-TD6A-41416		54		5
						0914		6
								7
								8
								9
								10
								11
								12
								13
								14
								15
								16
								17
								18
								19
								20
								21
								22
								23
								24
								25
								26
	1.0	0.9	Good	KRF-TD6A-42627		250		27
						0454		28
								29
								30
								31
								32
								33
								34
								35
								36
								37
								38
								39
								40

PROJECT *KF Heating*  
JOB NO. 3688

BORING NO. TD6A

(clay, silty, w/ some gravel, sl. moist, med. to dk brn, #1 liner)

Gravel at 19'

Water at ~25'

150 blows for 1' driven

Gravel, clayey, yellowish brn, tan, wet, solvent smell

#1 liner

NOTES:



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HMUSCAN (PPM) %	LITHOLOGIC CODE	DEPTH (FEET)
								11
								12
								13
								14
	2.0	1.1	Good		KRF-TD5A-11416	71000		15
								16
								17
					@ KRF-TD5A-0710			18
								19
								20
								21
								22
								23
								24
	0.9	0.9	Good		KRF-TD5A-42425	300		25
								26
					KRF-0745			7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT RF Heating  
JOB NO. 3688

BORING NO. TD5A

Slty, clayey, w/ some gravel, med. to dk brn, sh. moist.  
#1 liner

Gravel at 18.5'

100 blows for 0.9' driven  
gravel, clayey, yellowish brn, wet in spots, solvent odor  
#1 liner

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
								1	AF <i>Rotating</i>	
								2	JOB NO. 3688	TD3A
								3		
								4		
	2.0	0.8	Good		KRF - TD3A-41416	38		5		
						@1502		6		
								7		
								8		
								9		
								20		
								21		
								22		
								23		
	1.0	0.5	Fair		KRF - TD3A-42425	120		24		
						@1533		25		
								26		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

Libr, clayey, w/ some gravel, med to dk brn, moist  
#1 liner

Gravel at ~18.5'

24'-25' Gravel, clayey, yellowish brn, wet, solvent odor  
#1 liner

NOTES:



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAN (PPM) <sup>BY</sup>	LITHOLOGIC CODE	DEPTH (FEET)
								11
	2.0	0.2	Good			0		12
								13
								14
								15
	2.0	1.1	Good			198		16
								17
	2.0	1.4	Good			500		18
								19
								20
								21
	1.2	1.1	Good			380		22
								23
								24
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT *HF Heating*  
JOB NO. 3688

BORING NO. F5A

12'-14' Silt, clayey, w/ gravel, light br, very dry, powdery texture, more moist at bottom, hard.

16'-18' Silt, clayey, w/ gravel, med. br to dk br, moist, #2 line

18'-20' Silt, clayey, w/ gravel, med. to dk br, moist, wet in spots at bottom, slight odor, #2 line  
Driller reports gravel at 21.5'

22'-23.2' Gravel, silty, clayey, yellowish br, moist, slight odor #2 line

200 blows for 12' driven

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.5	Good	11RF-F4A-4124	13			11
	2.0	1.5	Good	11RF-F4A-4124	13			12
					13			13
					13			14
					13			15
					13			16
	2.0	1.2	Good	11RF-F4A-4148	220			17
					220			18
					220			19
					220			20
					220			21
					220			22
					220			23
					220			24
					220			25
					220			26
					220			27
	1.0	1.0	Good	11RF-F4A-42829	100			28
					100			29
					100			30
					100			1
					100			2
					100			3
					100			4
					100			5
					100			6
					100			7
					100			8
					100			9
					100			0

PROJECT RF Heating  
JOB NO. 3688

BORING NO. F4A

12'-14' Silt, clayey, w/ some gravel, med. to dk brn, moist

#1 liner - duplicate

#2 liner - regular

16'-18' Silt, clayey, w/ some gravel, med. to dk brn, moist, solvent odor

#2 liner

Driller reports gravel at 21'

28'-29'

200 blows for 1.0' driven

Gravel, silty, yellowish brn, wet, solvent odor, #1 liner

NOTES:

 **HALLIBURTON NUS**  
Environmental Corporation

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
									AF <i>Testing</i>	F 3 A
	2.0	0.8	Fin			100		11		
						1034		12		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

*10'-12'*  
*Silt, slightly clayey, w/ gravel, light brown, very dry, sandy.*  
*#1 log*

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	RESCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
									RF Heating	F2A
								11	JOB NO. 3688	
								12		
								13		
	2.0	0.7	Good		F2A-111416			14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
	1.0	1.4	Good					27		
								28		
								29		
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		

14-16' Silty, clayey, w/ some gravel, light br, dried out portion, med. to dark br, sl. moist portion. Top part of sample is very dried out, powdery appearance; lower half is sl. moist and very hard, more cohesive #1 liner (chunk of hard soil in shoe (catcher) blocked better sample recovery. Driller reports gravel at 17.5' bottom bit is wet when pulled at 26'

26-27' 150 blows for 1.0' driven Gravel, clayey, yellowish br, wet, strong silty odor #1 liner - duplicate #2 liner - regular

NOTES:

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**HALLIBURTON NUS**  
Environmental Corporation

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
	2.0	0.6	Fair		KRF-FIA-41820	6		11	RF Testing	FIA
					KRF-FIA-41820			12		
								13		
								14		
								15		
								16		
								17		
	2.0	1.5	Good		KRF-FIA-41820	460		18		
					KRF-FIA-41820			19		
								20		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

10-12'

Silt, clayey, w/ gravel, light  
 brown, extremely dry, powdery,  
 #1 liner

(clay, silty, w/ gravel, dk brown, moist  
 solvent odor

#1 liner duplicate  
 #2 liner regular

NOTES:

SHEET 2 OF 2

**NOTES:**



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAN OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
								11	RF Nesting	E7A
	2.0	1.4	Good		41214	1050		12		
					HA-F-E7A	62		13		
								14		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

Clay, silty, w/ some gravel, moist med. to dk br  
 #2 liner  
 #1 liner - particle analysis  
 #3 liner - particle analysis duplicate

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
								1	RF Keating	E6A
								2	JOB NO. 3688	
								3		
								4		
								5		
								6		
	2.0	1.2	Good		KRF-E6A-4/6/8	60		7		
								8		
								9		
								10		
	2.0	0.4	Good		KRF-E6A-6/24	55		11		
								12		
	1.0	0.2	Good					13		
								14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
								27		
								28		
								29		
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		

Silt, clayey, w/ gravel, med. to dk. br, sl. moist, up to 60 ppm max., ~20 ppm sustained.  
 #1 liner, #2 liner for particle size  
 Silt, clayey, w/ gravel, med. to dk. br, moist, solvent odor  
 #1 liner

NOTES:



# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	AVA HUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.4	Good	NAF-E5A-4124	140	1307		11
	2.0	0.7	Good	NAF-E5A-4124	0	1320		12
				NAF-E5A-4120				13
								14
								15
								16
								17
	2.0	1.6	Good	NAF-E5A-4120	240	1331		18
								19
	2.0	1.5	Good	NAF-E5A-4122	>1000	1342		20
								21
								22
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT RF Hesting  
JOB NO. 3688

BORING NO.

E5A

10'-12'

Silt, clayey, w/ gravel, light  
br, very dry, powdery, #2 liner  
12-14' Silt, clayey, minor gravel, very  
dry, powdery  
#1 liner

18'-20' Silt, clayey, minor gravel, sand  
med. to dk br, moist  
#2 liner

20'-22' Silt, clayey, sandy, minor  
gravel, dk br, moist  
#2 liner

NOTES:

SHEET 2 OF 2

**NOTES:**

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANALYST (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
									RF <i>Noting</i>	E3A
								11		
								12		
								13		
								14		
	2.0	1.6	Good	KRF-E3A-11416	8	1141		15		
								16		
	2.0	1.6	Good	KRF-E3A-11416	1142	220		17		
								18		
								19		
	2.0	1.7	Good	KRF-E3A-11416	260	1150		20		
								21		
								22		
								23		
								24		
								25		
								26		
								27		
								28		
	0.7	0.7	Good	KRF-E3A-11416	140	1239		29		
								30		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

14'-16'

Silt, clay, some gravel, med. to dk brn, sl. moist

#1 liner - duplicate

#2 liner - regular

16'-18' Silt, clay, sandy, w/ some gravel, med. brn to dk brn, moist, strong solvent odor

#1 liner duplicate

#2 liner regular

19' Gravel

20'-22' Clay, sandy, silty, minor gravel, med. to dk brn, moist, strong solvent odor

#2 liner - regular

28'-29.7' Gravel, clayey, yellowish brn, wet, strong solvent odor, #1 liner

NOTES:

# FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
	2.0	1.1	Good			5		11	RF Heating	E2A
								12		
								13		
								14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
	2.0	0.6	Fair			260		27		
								28		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

10'-12' Silty, clay, w/ gravel, med.  
to dk br, sat. moist  
#1 liner

Gravel at 25'

26' - 26.6' Gravel, clayey, yellowish  
brown, wet at lower 0.2'; strong shear  
#1 liner

NOTES:



**HALLIBURTON NUS**  
Environmental Corporation

# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E3A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jedi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow stem auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 28.7

TIME STARTED 1058

DATE 7/8/94

TIME COMPLETED 1337

DATE 7/8/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

~25'

BACKFILLED, 1354

DATE 7/8/94

WEATHER CONDITIONS

Partly Cloudy - to 90°F, SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	RNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10



**HALLIBURTON NUS**  
Environmental Corporation

# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PLAN

PROJECT <i>RF Heating</i>	BORING NO. <i>EYA</i>
JOB NO. <i>3688</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>Jedi</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow Stem Auger</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>26</i>	
TIME STARTED <i>0732</i>	DATE <i>7/12/94</i>
TIME COMPLETED <i>0923</i>	DATE <i>7/12/94</i>

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	THU SCAN (PPM)	OYA	LITHOLOGIC CODE	DEPTH (FEET)
									1
									2
									3
									4
									5
									6
	2.0	0.8	Good						7
									8
									9
	2.0	0.7	Fair						10

GROUND-WATER CONDITION AT COMPLETION OF DRILLING <i>~25'</i>	
BACKFILLED, TIME <i>0940</i>	DATE <i>7/12/94</i>
WEATHER CONDITIONS <i>Partly cloudy, mid 70°F, SE wind</i>	
SURFACE ELEVATION	
COMMENTS	
<i>6'-8'</i>	
<i>Silt, clayey, w/ gravel, dried out to sl. moist, red. br.</i>	
<i>Took 5'-10' sample, bot driller dropped it into beam bucket, will resample @ 9'-11'</i>	
<i>9'-11' Silt, clayey, w/ gravel, and</i>	





# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E5A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jodi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 22

TIME STARTED 1228

DATE 7/12/94

TIME COMPLETED 1357

DATE 7/12/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME 1357

DATE 7/12/94

WEATHER CONDITIONS

Partly Cloudy, to 90°F, strong SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
	0.6	0.6				10		5
	2.0	0.9	Good		KRF-E5A-40406	@124H		6
								7
	2.0	1.6	Good			140		8
						@1253		9
								10

4'-6' 1st run recovered 0.6', recovered concrete ~ 4" in spoon; ~~what~~ back in being to get 4'-6' interval Silt, clayey, w/ gravel, #1 liner

6'-8' Silt, clayey, w/ gravel, light iron, very dried out, powdery #2 liner

# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT RF Heating BORING NO. E6A  
 JOB NO. 3688 LOGGED BY: BPH  
 PROJ. MGR. CFB EDITED BY:  
 DRILLING COMPANY: Jedi  
 DRILL RIG TYPE: Mobile B-61  
 DRILLING METHOD: Hollow Stem Auger  
 DRILLERS NAME: Ramon  
 TOTAL DEPTH (FT.) 23

TIME STARTED 0737 DATE 7/7/94  
 TIME COMPLETED 0940 DATE 7/7/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING Dry

BACKFILLED, TIME 0948 DATE 7/7/94

WEATHER CONDITIONS

Partly Cloudy, mid 70°F, SE wind, mod

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HHW SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
SP	2.0	0.4	Good					9
								10

ART-E6A-40810

12

0800

Silt, clayey w/ some gravel, med. to dk brown, sh. moist  
#1 liner, #2 liner for particle analysis

# FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E7A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jedi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Augers

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 14

TIME STARTED 1000

DATE 7/7/94

TIME COMPLETED 1102

DATE 7/7/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME 1114

DATE 7/7/94

WEATHER CONDITIONS

Partly Cloudy, upper 80°F, SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HAND SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
					KRF-E7A-40204			1
								2
	2.0	1.7	Good			3		3
								4
								5
								6
								7
								8
								9
								10

Silt, clayey, w/ some gravel up to 3" diam., med brn.

#2 liner

#1 line duplicate

#3 line particle analysis



# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E 8A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CF8

EDITED BY:

DRILLING COMPANY: JEDI

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 27

TIME STARTED 1055

DATE 7/7/94

TIME COMPLETED 1450

DATE 7/7/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

~ 25'

BACKFILLED, TIME 1506

DATE 7/7/94

WEATHER CONDITIONS

Partly Cloudy, mid 90°F, SE wind, gusty

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
--------------	-------------	----------------	------------------	--------------------------------	--------------------------------	----------------	-----------------	--------------

2.0 1.3 Good

KAF-E8A-40608  
1314

1  
2  
3  
4  
5  
6  
7  
8  
9  
10

304



SHEET 1 OF 2

BORING NO.

FIA

LOGGED BY: BDH

**EDITED BY:**

DRILLING COMPANY: *Redi*

DRILL RIG TYPE: *Mobile B-61*

DRILLING METHOD: *Hollow Stem Auger*

DRILLERS NAME: *Ramon*

TOTAL DEPTH (FT.) 20

TIME STARTED 1058

DATE 7/9/94

TIME COMPLETED 1200

DATE 7/9/94

**GROUND-WATER CONDITION AT  
COMPLETION OF DRILLING**

BACKFILLED,  
TIME 1209

DATE 7/9/94

### WEATHER CONDITIONS

Partly cloudy, hot, ~~upper~~ 80°F, slight SE in

**SURFACE  
ELEVATION**

## COMMENTS

**SAMPLER TYPE**

**FEET  
DRIVEN**

**FEET  
RECOVER**

**SAMPLE  
CONDITI**

FIELD L  
SAMPLING

**FIXED L**

11:55 AM  
12:05 PM

LITHOL

**CODE**  
**DEPTH**

11331

2.0 | 0.6 7mm

KRF- FIA-60406

①

Like, in, w/ gravel, concrete,  
asphalt-like material, med. to dk  
br, concrete at end of shoe blocking  
it.

4, line



# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

Blank area for plan drawing.

PROJECT <i>RF Heating</i>	BORING NO. <i>F2A</i>
JOB NO. <i>3688</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>BDI</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow stem Auger</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>27.4</i>	
TIME STARTED <i>0738</i>	DATE <i>7/11/94</i>
TIME COMPLETED <i>0915</i>	DATE <i>7/11/94</i>

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU \$CAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10

GROUND-WATER CONDITION AT COMPLETION OF DRILLING  
*~ 25'*

BACKFILLED, TIME <i>0920</i>	DATE <i>7/11/94</i>
------------------------------	---------------------

WEATHER CONDITIONS  
*Partly Cloudy, mid 70°F, light SE wind*

SURFACE ELEVATION

COMMENTS

Blank area for comments.



SHEET 1 OF 2

PROJECT	BORING NO.
RF <i>Watering</i>	F3A
JOB NO. 3688	LOGGED BY: CFB
PROJ. MGR. CFB	EDITED BY:
DRILLING COMPANY: <i>Jedi</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow stem Auger</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) 12	
TIME STARTED 1007	DATE 7/12/94
TIME COMPLETED 1037	DATE 7/12/94

GROUND-WATER CONDITION AT  
COMPLETION OF DRILLING

BACKFILLED, TIME 1041	DATE 7/12/94
--------------------------	--------------

WEATHER CONDITIONS

Partly cloudy; upper 70°F; SE wind  
SURFACE

**SURFACE ELEVATION**

COMMENTS

[illegible]

307



# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

F4A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jdi

DRILL RIG TYPE: Mobile R-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 29

TIME STARTED 1248

DATE 7/11/94

TIME COMPLETED 1450

DATE 7/11/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

~25'

BACKFILLED, TIME 1500

DATE 7/11/94

WEATHER CONDITIONS

Fair, hot, to 90°F, light SE wind

SURFACE ELEVATION

COMMENTS

Silt, clayey, w/ gravel, red  
brn to dk brn, dry to sl  
moist, w/ brick fragments,  
#2 liner

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
--------------	-------------	----------------	------------------	--------------------------------	--------------------------------	----------------	-----------------	--------------

2.0

1.2

Good

KRF-F4A-110002.

6

@1305

1

2

3

4

5

6

7

8

9

10

808





**HALLIBURTON NUS**  
Environmental Corporation

# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

RF *Heating*

BORING NO.

F5A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: *Jedi*

DRILL RIG TYPE: *mobile B-61*

DRILLING METHOD: *Hollow Stem Auger*

DRILLERS NAME: *Ramon*

TOTAL DEPTH (FT.) 23.2

TIME STARTED 0942

DATE 7/11/94

TIME COMPLETED 1123

DATE 7/11/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME 1129

DATE 7/11/94

WEATHER CONDITIONS

*Partly Cloudy, mid 80°F, light SE wind*

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU \$CAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
--------------	-------------	----------------	------------------	--------------------------------	--------------------------------	-----------------	-----------------	--------------

1

2

3

4

5

6

7

8

9

10

# FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

TD3A

JOB NO. 36880

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jdi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 25

TIME STARTED 1420

DATE 7/8/94

TIME COMPLETED 1554

DATE 7/8/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

~25'

BACKFILLED, TIME 1604

DATE 7/8/94

WEATHER CONDITIONS

Partly Cloudy, upper 90°F, moderate SE.

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HH SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10

4.5

2.0

0.2

Poor

28

5-7'

2.0

0.2

6

6.5-8.5

2.0

0.6

Poor

1450

KAF-TD3A-20608

4.0'-4.2' Silt, clayey w/ gravel, piece of concrete at end of samples blocking sample recovery

Concrete still preventing good recovery, will go down 1' and try again.

6.5'-8.5' Silt, clayey, w/ gravel, med. to dk br, al. moist #1 liner



SHEET 1 OF 2

**1 BORING NO.**

Tb 5A

LOGGED BY: BDH

**EDITED BY:**

DRILL RIG TYPE: *Mobile B-61*

DRILLING METHOD: *Hollow Stem Auger*

DRILLERS NAME: *Ramona*

TOTAL DEPTH (FT.) 248

TIME STARTED 0643

DATE 7/8/94

TIME COMPLETED 0812

DATE 7/8/94

**GROUND-WATER CONDITION AT  
COMPLETION OF DRILLING**

BACKFILLED, 0822  
TIME

DATE 7/8/94

### WEATHER CONDITIONS

Partly Cloudy  
SURFACE

**SURFACE  
ELEVATION**

## COMMENTS

**Abstract**

Good

KRF - 7D5A-40406

4

0674

# FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

TD6A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jedi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 27

TIME STARTED 0846

DATE 7/8/94

TIME COMPLETED 1012

DATE 7/8/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

25'

BACKFILLED, TIME 1030

DATE 7/8/94

WEATHER CONDITIONS

Partly Cloudy, to 80°F, SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
	2.0	0.9	Good					5
								6
								7
								8
								9
								10

RF TD6A-40406

3

## PERMEABILITY CALCULATIONS

### CALCULATIONS:

APPENDIX L

Equation used for calculations (from Reference 1):

$$k = \frac{Q \mu [\ln (R_w / R_i)]}{H \pi P_w [1 - (P_{ATM} / P_w)^2]}$$

where:

- k = vapor permeability
- Q = vapor flow rate (ASCFM)
- $\mu$  = viscosity (lb·s/ft<sup>2</sup>)
- R<sub>w</sub> = well radius (ft.)
- R<sub>i</sub> = radius of influence (ft.)
- H = total screen length (ft.)
- P<sub>w</sub> = pressure at well (lb/ft<sup>2</sup>)
- P<sub>ATM</sub> = atmospheric pressure (lb/ft<sup>2</sup>)

Example Calculation (Data for 5/6/94):

Convert Barometric Pressure to P<sub>ATM</sub> in lb/ft<sup>2</sup>:

$$P_{ATM} = 29.3 \text{ in. Hg} \left( \frac{14.696 \text{ lb/ft}^2}{29.921 \text{ in. Hg}} \right) \left( \frac{12 \text{ in}}{1 \text{ ft}} \right)^2$$

$$\underline{P_{ATM} = 2072}$$

Convert Differential Pressure, V, at Well To Absolute Pressure, P<sub>w</sub>, in lb/ft<sup>2</sup>:

$$P_w = P_{ATM} + V \left( \frac{14.696 \text{ lb/ft}^2}{406.8 \text{ in. H}_2\text{O}} \right) \left( \frac{12 \text{ in}}{1 \text{ ft}} \right)^2$$

$$P_w = 2072 + (-38.5 \text{ in. H}_2\text{O}) \left( \frac{14.696 \text{ lb/ft}^2}{406.8 \text{ in. H}_2\text{O}} \right) \left( \frac{12 \text{ in}}{1 \text{ ft}} \right)^2$$

$$\underline{P_w = 1872}$$

Total Screen Length, H:

$$H = (\# \text{ of wells})(9\text{ft})$$

$$H = (3)(9)$$

$$\underline{H = 27}$$

9  
 E8  
 KRF-E8-U2628  
 26 - 28  
 9  
 F1  
 KRF-F1-U0406  
 4 - 6  
 9  
 F1  
 KRF-F1-U1012  
 10 - 12  
 9  
 F1  
 KRF-F1-U1820  
 18 - 20

PARAMETER

418.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)  
 Hydrocarbons

2060 [1] 6910 (147) [5] 1240 (33.6) [1] 5440 (158) [5]

V08240 - Volatile Organics (ug/kg)

1,1,1-Trichloroethane	NA	ND	(1.83)	[1]	NA	NA
1,1,1,2,2-Tetrachloroethane	NA	ND	(4.98)	[1]	NA	NA
1,1,1,2-Trichloroethane	NA	ND	(1.5)	[1]	NA	NA
1,1,1-Dichloroethane	NA	ND	(1.68)	[1]	NA	NA
1,1,1-Dichloroethene	NA	ND	(2.52)	[1]	NA	NA
1,1,2-Dichloroethane	NA	ND	(1.7)	[1]	NA	NA
1,2-Dichloropropane	NA	ND	(2.57)	[1]	NA	NA
2-Chloroethyl vinyl ether	NA	ND	(2.81)	[1]	NA	NA
2-Hexanone	NA	ND	(0.941)	[1]	NA	NA
4-Methyl-2-Pentanone(MIBK)	NA	ND	(0.898)	[1]	NA	NA
Acetone	NA	13.7 8	(1.47)	[1]	NA	NA
Benzene	NA	ND	(1.89)	[1]	NA	NA
Bromodichloromethane	NA	ND	(1.6)	[1]	NA	NA
Bromomethane	NA	ND	(1.97)	[1]	NA	NA
Carbon disulfide	NA	ND	(2.54)	[1]	NA	NA
Carbon tetrachloride	NA	ND	(1.96)	[1]	NA	NA
Chlorobenzene	NA	9.95	(4.56)	[1]	NA	NA
Chloroethane	NA	ND	(2.01)	[1]	NA	NA
Chloroform	NA	ND	(2.05)	[1]	NA	NA
Chloromethane	NA	ND	(2.39)	[1]	NA	NA
Dibromochloromethane	NA	ND	(1.8)	[1]	NA	NA
Ethyl benzene	NA	ND	(1.62)	[1]	NA	NA
Methyl ethyl ketone	NA	8.07 8	(1.5)	[1]	NA	NA
Methylene Chloride	NA	4.92	(2.56)	[1]	NA	NA
Styrene	NA	ND	(1.59)	[1]	NA	NA
Tetrachloroethene	NA	ND	(4.66)	[1]	NA	NA
Toluene	NA	2.93	(1.67)	[1]	NA	NA
Tribromomethane(Bromoform)	NA	ND	(1.48)	[1]	NA	NA
Trichloroethene	NA	ND	(4.77)	[1]	NA	NA
Vinyl Chloride	NA	ND	(2.03)	[1]	NA	NA
Vinyl acetate	NA	ND	(10.8)	[1]	NA	NA
Xylene (total)	NA	ND	(3.57)	[1]	NA	NA
cis-1,3-Dichloropropene	NA	ND	(1.58)	[1]	NA	NA

( ) = Detection Limit    □ = Dilution Factor    ND = Not Detected    NA = Not Applicable    \* - Value considered suspect, Refer to QC Report

Compiled: 22 June 1994

9  
E7  
KRF-E7-U0204  
2 - 4

9  
E7  
KRF-E7-U1214  
12 - 14

9  
E8  
KRF-E8-U0608  
6 - 8

9  
E8  
KRF-E8-U2426  
24 - 26

PARAMETER

V8240 - Volatile Organics, cont. (ug/kg)

trans-1,2-Dichloroethene	ND	(2.34)	[1]	NA	ND	(2.41)	[1]	NA
trans-1,3-Dichloropropene	ND	(1.74)	[1]	NA	ND	(1.8)	[1]	NA

V8270 - Semivolatile Organics (ug/g)

1,1,2,4-Trichlorobenzene	ND	(0.0176)	[1]	NA	ND	(0.0357)	[1]	NA
1,1,2-Dichlorobenzene	ND	(0.0245)	[1]	NA	< DL	(0.0302)	[1]	NA
1,1,3-Dichlorobenzene	ND	(0.0223)	[1]	NA	ND	(0.0183)	[1]	NA
1,4-Dichlorobenzene	ND	(0.0292)	[1]	NA	ND	(0.0287)	[1]	NA
2,4,5-Trichlorophenol	ND	(0.022)	[1]	NA	ND	(0.0286)	[1]	NA
2,4,6-Trichlorophenol	ND	(0.0262)	[1]	NA	ND	(0.0206)	[1]	NA
2,4-Dichlorophenol	ND	(0.0347)	[1]	NA	ND	(0.00922)	[1]	NA
2,4-Dimethylphenol	ND	(0.0322)	[1]	NA	ND	(0.036)	[1]	NA
2,4-Dinitrophenol	ND	(0.0447)	[1]	NA	ND	(0.114)	[1]	NA
2,4-Dinitrotoluene	ND	(0.0273)	[1]	NA	ND	(0.0205)	[1]	NA
2,6-Dinitrotoluene	ND	(0.0298)	[1]	NA	ND	(0.0323)	[1]	NA
2-Chloronaphthalene	ND	(0.0262)	[1]	NA	ND	(0.0469)	[1]	NA
2-Chlorophenol	ND	(0.0226)	[1]	NA	ND	(0.0276)	[1]	NA
2-Methylnaphthalene	ND	(0.0232)	[1]	NA	ND	(0.0297)	[1]	NA
2-Methylphenol	ND	(0.0125)	[1]	NA	ND	(0.0259)	[1]	NA
2-Nitroaniline	ND	(0.0295)	[1]	NA	ND	(0.0469)	[1]	NA
2-Nitrophenol	ND	(0.0296)	[1]	NA	ND	(0.0282)	[1]	NA
3,3'-Dichlorobenzidine	ND	(0.0357)	[1]	NA	ND	(0.022)	[1]	NA
3-Nitroaniline	ND	(0.0311)	[1]	NA	ND	(0.0351)	[1]	NA
4,6-Dinitro-2-methylphenol	ND	(0.0392)	[1]	NA	ND	(0.0398)	[1]	NA
4-Bromophenyl phenyl ether	ND	(0.0167)	[1]	NA	ND	(0.0359)	[1]	NA
4-Chloro-3-methylphenol	ND	(0.016)	[1]	NA	ND	(0.0271)	[1]	NA
4-Chlorophenyl phenyl ether	ND	(0.0187)	[1]	NA	ND	(0.0234)	[1]	NA
4-Methylphenol/3-Methylphenol	ND	(0.0146)	[1]	NA	ND	(0.0179)	[1]	NA
4-Nitroaniline	ND	(0.0435)	[1]	NA	ND	(0.0444)	[1]	NA
4-Nitrophenol	ND	(0.0463)	[1]	NA	ND	(0.114)	[1]	NA
Acenaphthene	ND	(0.0255)	[1]	NA	ND	(0.0296)	[1]	NA
Acenaphthylene	ND	(0.0253)	[1]	NA	ND	(0.0259)	[1]	NA
Anthracene	ND	(0.0305)	[1]	NA	ND	(0.024)	[1]	NA
Benzo(a)anthracene	0.0787	(0.0237)	[1]	NA	0.0309	(0.0225)	[1]	NA
Benzo(a)pyrene	0.0831	(0.0317)	[1]	NA	0.0385	(0.0284)	[1]	NA
Benzo(b)fluoranthene	0.169 F	(0.0419)	[1]	NA	0.0987 F	(0.0287)	[1]	NA

Compiled: 22 June 1994

( ) = Detection Limit    □ = Dilution Factor    ND = Not Detected    NA = Not Applicable    \* - Value considered suspect. Refer to QC Report

9  
E6  
KRF-E6-U02022  
20 - 22

9  
E6  
KRF-E6-U1618D  
16 - 18

9  
E6  
KRF-E6-U1618  
16 - 18

9  
E6  
KRF-E6-U0810  
8 - 10

PARAMETER

8270 - Semivolatile Organics, cont. (ug/g)

benzo(g,h,i)perylene	0.17	(0.134)	[1]	ND	(0.149)	[1]	ND	(0.147)	[1]	ND	(1.33)	[1]
benzo(k)fluoranthene	1.04 F	(0.13)	[1]	ND	(0.145)	[1]	ND	(0.143)	[1]	ND	(1.29)	[1]
benzoic acid	ND	(3.09)	[1]	ND	(3.45)	[1]	ND	(3.4)	[1]	ND	(30.6)	[1]
benzyl alcohol	ND	(0.0638)	[1]	ND	(0.0712)	[1]	ND	(0.0701)	[1]	ND	(0.632)	[1]
butylbenzylphthalate	< DL	(0.216)	[1]	ND	(0.241)	[1]	ND	(0.238)	[1]	ND	(2.14)	[1]
chrysene	0.65	(0.118)	[1]	ND	(0.131)	[1]	ND	(0.129)	[1]	ND	(1.16)	[1]
1-n-octylphthalate	ND	(0.0611)	[1]	ND	(0.0681)	[1]	ND	(0.0672)	[1]	ND	(0.605)	[1]
1-benz(a,h)anthracene	ND	(0.119)	[1]	ND	(0.132)	[1]	ND	(0.13)	[1]	ND	(1.17)	[1]
1-benzofuran	< DL	(0.0657)	[1]	ND	(0.0733)	[1]	ND	(0.0722)	[1]	ND	(0.65)	[1]
1-butylphthalate	ND	(0.0586)	[1]	ND	(0.0654)	[1]	ND	(0.0644)	[1]	0.679	(0.58)	[1]
1-ethylphthalate	ND	(0.0301)	[1]	ND	(0.0335)	[1]	ND	(0.0331)	[1]	ND	(0.298)	[1]
1-methylphthalate	ND	(0.0531)	[1]	ND	(0.0592)	[1]	ND	(0.0584)	[1]	ND	(0.526)	[1]
1-phenylamine	ND	(0.107)	[1]	ND	(0.119)	[1]	ND	(0.117)	[1]	ND	(1.06)	[1]
fluoranthene	1.03	(0.0699)	[1]	0.104	(0.078)	[1]	ND	(0.0768)	[1]	2.19	(0.692)	[1]
fluorene	0.0699	(0.0544)	[1]	ND	(0.0607)	[1]	ND	(0.0598)	[1]	ND	(0.539)	[1]
hexachlorobenzene	ND	(0.0653)	[1]	ND	(0.0729)	[1]	ND	(0.0718)	[1]	ND	(0.647)	[1]
hexachlorobutadiene	ND	(0.122)	[1]	ND	(0.136)	[1]	ND	(0.134)	[1]	ND	(1.21)	[1]
hexachlorocyclopentadiene	ND	(0.141)	[1]	ND	(0.157)	[1]	ND	(0.155)	[1]	ND	(1.4)	[1]
hexachloroethane	ND	(0.0655)	[1]	ND	(0.073)	[1]	ND	(0.0719)	[1]	ND	(0.648)	[1]
indeno(1,2,3-cd)pyrene	0.168	(0.105)	[1]	ND	(0.117)	[1]	ND	(0.115)	[1]	ND	(1.04)	[1]
sophorone	ND	(0.0383)	[1]	ND	(0.0427)	[1]	ND	(0.0421)	[1]	ND	(0.379)	[1]
N-Nitroso-di-n-propylamine	ND	(0.0731)	[1]	ND	(0.0815)	[1]	ND	(0.0803)	[1]	ND	(0.724)	[1]
naphthalene	ND	(0.0915)	[1]	0.47	(0.102)	[1]	ND	(0.101)	[1]	1.16	(0.906)	[1]
nitrobenzene	ND	(0.0521)	[1]	ND	(0.0581)	[1]	ND	(0.0572)	[1]	ND	(0.515)	[1]
pentachlorophenol	ND	(0.113)	[1]	ND	(0.126)	[1]	ND	(0.124)	[1]	ND	(1.12)	[1]
phenanthrene	0.336	(0.0783)	[1]	0.126	(0.0873)	[1]	ND	(0.086)	[1]	< DL	(0.775)	[1]
phenol	ND	(0.0442)	[1]	ND	(0.0493)	[1]	ND	(0.0486)	[1]	ND	(0.437)	[1]
pyrene	0.946	(0.0839)	[1]	< DL	(0.0936)	[1]	ND	(0.0922)	[1]	< DL	(0.831)	[1]
1s(2-Chloroethoxy)methane	ND	(0.075)	[1]	ND	(0.0836)	[1]	ND	(0.0824)	[1]	ND	(0.742)	[1]
1s(2-Chloroethyl)ether	ND	(0.0578)	[1]	ND	(0.0645)	[1]	ND	(0.0635)	[1]	ND	(0.572)	[1]
1s(2-Chloroisopropyl)ether	ND	(0.0525)	[1]	ND	(0.0586)	[1]	ND	(0.0577)	[1]	ND	(0.52)	[1]
1s(2-Ethylhexyl)phthalate	< DL	(0.315)	[1]	3.18	(0.351)	[1]	< DL	(0.346)	[1]	18.1	(3.12)	[1]
2-Chloroaniline	ND	(0.111)	[1]	ND	(0.124)	[1]	ND	(0.122)	[1]	ND	(1.1)	[1]

846 - Percent Moisture (percent)

percent moisture	16	(0)	[1]	24.3	(0)	[1]	23.1	(0)	[1]	18.9	(0)	[1]
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implied: 22 June 1994

( ) = Detection Limit [ ] = Dilution Factor ND = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to QC Report



9  
E6  
KRF-E6-U0810  
8 - 10

9  
E6  
KRF-E6-U1618  
16 - 18

9  
E6  
KRF-E6-U16180  
16 - 18

9  
E6  
KRF-E6-U2022  
20 - 22

PARAMETER

418.1 - Total Recoverable Petroleum Hydrocarbons	(mg/kg)	[5]	3160	(165)	[5]	233	(32.4)	[1]	22700	(615)	[20]
Hydrocarbons	1860										
8240 - Volatile Organics (ug/kg)											
1,1,1,1-Tetrachloroethane	ND	[1]	ND	(41.6)	[20]	ND	(41)	[20]	ND	(2430)	[2000]
1,1,1,2-Tetrachloroethane	ND	[1]	ND	(85.1)	[20]	ND	(83.8)	[20]	ND	(3170)	[2000]
1,1,1,2-Trichloroethane	ND	[1]	ND	(50.8)	[20]	ND	(50)	[20]	ND	(2400)	[2000]
1,1,1,2-Trichloroethane	ND	[1]	ND	(48.7)	[20]	ND	(48)	[20]	ND	(1910)	[2000]
1,1,1-Dichloroethane	ND	[1]	ND	(68.7)	[20]	ND	(67.7)	[20]	ND	(4710)	[2000]
1,1,1-Dichloroethane	ND	[1]	ND	(72.4)	[20]	ND	(71.3)	[20]	ND	(3480)	[2000]
1,1,2-Dichloroethane	ND	[1]	ND	(45.3)	[20]	ND	(44.6)	[20]	ND	(6580)	[2000]
1,2-Dichloropropane	ND	[1]	ND	(26.3)	[20]	ND	(25.9)	[20]	ND	(3480)	[2000]
2-Chloroethyl vinyl ether	ND	[1]	ND	(81.4)	[20]	ND	(80.1)	[20]	ND	(3850)	[2000]
2-Hexanone	ND	[1]	ND	(70.3)	[20]	ND	(69.2)	[20]	ND	(2600)	[2000]
4-Methyl-2-Pentanone(MIBK)	ND	[1]	ND	(110)	[20]	ND	(108)	[20]	< DL	(14400)	[2000]
Acetone	335 B	[1]	ND	(94.8)	[20]	ND	(93.3)	[20]	13100	(1610)	[2000]
Benzene	ND	[1]	ND	(60.3)	[20]	ND	(59.4)	[20]	ND	(8810)	[2000]
Bromodichloromethane	ND	[1]	ND	(96.7)	[20]	ND	(95.2)	[20]	ND	(4540)	[2000]
Bromomethane	ND	[1]	ND	(89)	[20]	ND	(87.6)	[20]	ND	(3610)	[2000]
Carbon disulfide	ND	[1]	ND	(71.9)	[20]	ND	(70.8)	[20]	ND	(3560)	[2000]
Carbon tetrachloride	ND	[1]	ND	(57.4)	[20]	1180	(56.5)	[20]	203000	(2480)	[2000]
Chlorobenzene	12.4	[1]	2310	(86.4)	[20]	ND	(85.1)	[20]	ND	(3310)	[2000]
Chloroethane	ND	[1]	ND	(38.2)	[20]	ND	(37.6)	[20]	ND	(1480)	[2000]
Chloroform	ND	[1]	ND	(73.5)	[20]	ND	(72.3)	[20]	ND	(2390)	[2000]
Chloromethane	ND	[1]	ND	(42.9)	[20]	ND	(42.3)	[20]	ND	(1740)	[2000]
Dibromochloromethane	ND	[1]	ND	(62.9)	[20]	< DL	(62)	[20]	< DL	(2700)	[2000]
Ethyl benzene	ND	[1]	< DL	(107)	[20]	ND	(105)	[20]	9100 B	(6770)	[2000]
Methyl ethyl ketone	76.4 B	[1]	ND	(106)	[20]	ND	(104)	[20]	5910	(4540)	[2000]
Methylene Chloride	< DL	[1]	ND	(45)	[20]	ND	(44.3)	[20]	ND	(2650)	[2000]
Styrene	ND	[1]	ND	(68)	[20]	ND	(66.9)	[20]	ND	(3580)	[2000]
Tetrachloroethene	ND	[1]	ND	(39.5)	[20]	63.5	(38.9)	[20]	ND	(1980)	[2000]
Toluene	< DL	[1]	127	(53.7)	[20]	ND	(52.9)	[20]	ND	(1190)	[2000]
Tribromomethane(Bromoform)	ND	[1]	ND	(51.1)	[20]	ND	(50.3)	[20]	ND	(3830)	[2000]
Trichloroethene	ND	[1]	ND	(77.2)	[20]	ND	(76)	[20]	ND	(3020)	[2000]
Vinyl Chloride	ND	[1]	ND	(31.1)	[20]	ND	(30.6)	[20]	ND	(2010)	[2000]
Vinyl acetate	ND	[1]	ND	(123)	[20]	ND	(121)	[20]	ND	(6230)	[2000]
Xylene (total)	ND	[1]	228	(46.6)	[20]	< DL	(45.9)	[20]	ND	(1330)	[2000]
cis-1,3-Dichloropropene	ND	[1]	ND		[20]	ND		[20]			

Compiled: 22 June 1994 ( ) = Detection Limit [ ] = Dilution Factor ND = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to QC Report

9  
E4  
KRF-E4-U0911  
9 - 11

9  
E4  
KRF-E4-U2426  
24 - 26

9  
E5  
KRF-E5-U0406  
4 - 6

9  
E5  
KRF-E5-U0608  
6 - 8

PARAMETER

SV8270 - Semivolatile Organics, cont. (ug/g)

Benzo(g,h,i)perylene	ND XY (0.222)	[5]	< DL	(0.0717)	[1]	0.0406	(0.027)	[1]	0.0883	(0.0267)	[1]
Benzo(k)fluoranthene	< DL XY (0.216)	[5]	ND	(0.0936)	[1]	0.244 F	(0.0352)	[1]	0.735 F	(0.0349)	[1]
Benzoic acid	ND XY (5.13)	[5]	ND	(0.639)	[1]	ND	(0.24)	[1]	ND	(0.238)	[1]
Benzyl alcohol	ND XY (0.106)	[5]	ND	(0.0644)	[1]	ND	(0.0242)	[1]	ND	(0.024)	[1]
Butylbenzylphthalate	ND XY (0.359)	[5]	ND	(0.187)	[1]	ND	(0.0705)	[1]	0.0698	(0.0598)	[1]
Chrysene	< DL XY (0.195)	[5]	< DL	(0.0772)	[1]	0.133	(0.029)	[1]	0.388	(0.0288)	[1]
Di-n-octylphthalate	ND XY (0.101)	[5]	ND	(0.0845)	[1]	< DL	(0.0318)	[1]	0.034	(0.0315)	[1]
Dibenz(a,h)anthracene	ND XY (0.197)	[5]	ND	(0.0775)	[1]	ND	(0.0291)	[1]	< DL	(0.0289)	[1]
Dibenzofuran	ND XY (0.109)	[5]	ND	(0.0589)	[1]	ND	(0.0221)	[1]	0.038	(0.0219)	[1]
Dibutylphthalate	ND XY (0.0973)	[5]	0.158	(0.0616)	[1]	0.0323	(0.0232)	[1]	ND	(0.023)	[1]
Diethylphthalate	ND XY (0.0499)	[5]	ND	(0.0403)	[1]	ND	(0.0152)	[1]	ND	(0.015)	[1]
Dimethylphthalate	ND XY (0.0881)	[5]	ND	(0.0421)	[1]	ND	(0.0158)	[1]	ND	(0.0157)	[1]
Diphenylamine	ND XY (0.177)	[5]	ND	(0.0981)	[1]	ND	(0.0369)	[1]	ND	(0.0365)	[1]
Fluoranthene	0.265 XY (0.116)	[5]	0.703	(0.0664)	[1]	0.203	(0.025)	[1]	0.872	(0.0247)	[1]
Fluorene	ND XY (0.0902)	[5]	0.179	(0.0551)	[1]	< DL	(0.0207)	[1]	0.0572	(0.0205)	[1]
Hexachlorobenzene	ND XY (0.108)	[5]	ND	(0.0747)	[1]	ND	(0.0281)	[1]	ND	(0.0278)	[1]
Hexachlorobutadiene	ND XY (0.203)	[5]	ND	(0.078)	[1]	ND	(0.0293)	[1]	ND	(0.0291)	[1]
Hexachlorocyclopentadiene	ND XY (0.234)	[5]	ND	(0.226)	[1]	ND	(0.0848)	[1]	ND	(0.084)	[1]
Hexachloroethane	ND XY (0.109)	[5]	ND	(0.0893)	[1]	ND	(0.0336)	[1]	ND	(0.0332)	[1]
Indeno(1,2,3-cd)pyrene	ND XY (0.174)	[5]	ND	(0.0562)	[1]	0.0605	(0.0211)	[1]	0.106	(0.0209)	[1]
Isophorone	ND XY (0.0635)	[5]	ND	(0.081)	[1]	ND	(0.0305)	[1]	ND	(0.0302)	[1]
N-Nitroso-di-n-propylamine	ND XY (0.121)	[5]	ND	(0.0456)	[1]	ND	(0.0172)	[1]	ND	(0.017)	[1]
Naphthalene	ND XY (0.152)	[5]	3.51	(0.0671)	[1]	ND	(0.0252)	[1]	0.0271	(0.025)	[1]
Nitrobenzene	ND XY (0.0863)	[5]	ND	(0.121)	[1]	ND	(0.0454)	[1]	ND	(0.045)	[1]
Pentachlorophenol	ND XY (0.187)	[5]	ND	(0.112)	[1]	ND	(0.0422)	[1]	ND	(0.0418)	[1]
Phenanthrene	0.226 XY (0.13)	[5]	0.271	(0.0862)	[1]	0.128	(0.0324)	[1]	0.581	(0.0321)	[1]
Phenol	ND XY (0.0733)	[5]	ND	(0.0353)	[1]	ND	(0.0133)	[1]	ND	(0.0131)	[1]
Pyrene	0.228 XY (0.139)	[5]	0.0941	(0.0472)	[1]	0.194	(0.0178)	[1]	0.591	(0.0176)	[1]
bis(2-Chloroethoxy)methane	ND XY (0.124)	[5]	ND	(0.0887)	[1]	ND	(0.0334)	[1]	ND	(0.0331)	[1]
bis(2-Chloroethyl)ether	ND XY (0.0959)	[5]	ND	(0.0978)	[1]	ND	(0.0368)	[1]	ND	(0.0364)	[1]
bis(2-Chloroisopropyl)ether	ND XY (0.0871)	[5]	ND	(0.121)	[1]	ND	(0.0454)	[1]	ND	(0.045)	[1]
bis(2-Ethylhexyl)phthalate	ND XY (0.522)	[5]	2.73 B	(0.158)	[1]	0.908 B	(0.0593)	[1]	0.725 B	(0.0588)	[1]
p-Chloroaniline	ND XY (0.185)	[5]	ND	(0.0941)	[1]	ND	(0.0354)	[1]	ND	(0.0351)	[1]

SV846 - Percent Moisture (percent)

Percent moisture	14.8	(0)	[1]	7.6	(0)	[1]	16.7	(0)	[1]	15.6	(0)	[1]
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Compiled: 22 June 1994

( ) = Detection Limit [ ] = Dilution Factor ND = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to QC Report

9  
E4  
KRF-E4-U0911  
9 - 11

9  
E4  
KRF-E4-U2426  
24 - 26

9  
E5  
KRF-E5-U0406  
4 - 6

9  
E5  
KRF-E5-U0608  
6 - 8

PARAMETER

8.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)

729	3660	(54)	[2]	2710	(59.9)	[2]	1530	(29.6)	[1]
ND	ND	(1070)	[1000]	ND	(1.86)	[1]	ND	(1.85)	[1]
ND	ND	(1400)	[1000]	ND	(5.06)	[1]	ND	(5.03)	[1]
ND	ND	(1060)	[1000]	ND	(1.52)	[1]	ND	(1.51)	[1]
ND	ND	(841)	[1000]	ND	(1.71)	[1]	ND	(1.7)	[1]
ND	ND	(2080)	[1000]	ND	(2.56)	[1]	ND	(2.55)	[1]
ND	ND	(1540)	[1000]	ND	(1.73)	[1]	ND	(1.72)	[1]
ND	ND	(2900)	[1000]	ND	(2.62)	[1]	ND	(2.6)	[1]
ND	ND	(1540)	[1000]	ND	(2.85)	[1]	ND	(2.84)	[1]
ND	ND	(1700)	[1000]	ND	(0.956)	[1]	ND	(0.951)	[1]
ND	ND	(1150)	[1000]	ND	(0.913)	[1]	ND	(0.908)	[1]
194 B	< DL	(6350)	[1000]	24.8 B	(1.5)	[1]	13 B	(1.49)	[1]
< DL	823	(711)	[1000]	< DL	(1.72)	[1]	< DL	(1.71)	[1]
ND	ND	(3890)	[1000]	ND	(1.63)	[1]	ND	(1.62)	[1]
ND	ND	(2000)	[1000]	ND	(2)	[1]	ND	(1.99)	[1]
ND	ND	(1590)	[1000]	ND	(2.58)	[1]	ND	(2.57)	[1]
ND	ND	(1570)	[1000]	ND	(1.99)	[1]	ND	(1.98)	[1]
6.77	239000	(4720)	[2000]	7.41	(4.63)	[1]	12.6	(4.61)	[1]
ND	ND	(1460)	[1000]	ND	(2.04)	[1]	ND	(2.03)	[1]
ND	ND	(652)	[1000]	ND	(2.09)	[1]	ND	(2.08)	[1]
ND	1350	(1060)	[1000]	ND	(2.43)	[1]	ND	(2.42)	[1]
ND	ND	(767)	[1000]	ND	(1.83)	[1]	ND	(1.82)	[1]
ND	1360	(1190)	[1000]	ND	(1.65)	[1]	ND	(1.64)	[1]
48.1 B	4370 B	(2990)	[1000]	9.61 B	(1.52)	[1]	8.13 B	(1.51)	[1]
3.28	3100	(2000)	[1000]	8.68	(2.61)	[1]	4.33	(2.59)	[1]
ND	ND	(1170)	[1000]	ND	(1.62)	[1]	ND	(1.61)	[1]
ND	ND	(1580)	[1000]	ND	(4.74)	[1]	ND	(4.72)	[1]
2.54	< DL	(871)	[1000]	3.57	(1.7)	[1]	2.57	(1.69)	[1]
ND	ND	(524)	[1000]	ND	(1.51)	[1]	ND	(1.5)	[1]
ND	ND	(1690)	[1000]	ND	(4.85)	[1]	ND	(4.82)	[1]
ND	ND	(1330)	[1000]	ND	(2.06)	[1]	ND	(2.05)	[1]
ND	ND	(887)	[1000]	ND	(10.9)	[1]	ND	(10.9)	[1]
ND	10300	(2750)	[1000]	ND	(3.63)	[1]	ND	(3.61)	[1]
ND	ND	(587)	[1000]	ND	(1.6)	[1]	ND	(1.6)	[1]

Compiled: 22 June 1994

( ) = Detection Limit [ ] = Dilution Factor

ND = Not Detected

NA = Not Applicable

\* - Value considered suspect. Refer to QC Report

9  
E4  
KRF-E4-U0709  
7 - 9

9  
E3  
KRF-E3-U2829  
28 - 29

9  
E3  
KRF-E3-U2022  
20 - 22

9  
E3  
KRF-E3-U1618  
16 - 18

PARAMETER

8240 - Volatile Organics, cont. (ug/kg)

trans-1,2-Dichloroethene	ND	(211)	[100]	ND	(22100)	[10000]	NA	NA
trans-1,3-Dichloropropene	ND	(185)	[100]	ND	(19500)	[10000]	NA	NA

8270 - Semivolatile Organics (ug/g)

2,4-Trichlorobenzene	ND	(0.107)	[1]	11.5	(1.06)	[1]	NA	NA
2,2-Dichlorobenzene	< DL	(0.0908)	[1]	192	(0.896)	[1]	NA	NA
1,3-Dichlorobenzene	0.334	(0.0552)	[1]	14.2	(0.545)	[1]	NA	NA
1,4-Dichlorobenzene	2.42	(0.0865)	[1]	132	(0.853)	[1]	NA	NA
2,4,5-Trichlorophenol	ND	(0.0861)	[1]	ND	(0.85)	[1]	NA	NA
2,4,6-Trichlorophenol	ND	(0.0619)	[1]	ND	(0.611)	[1]	NA	NA
2,4-Dichlorophenol	ND	(0.0277)	[1]	ND	(0.274)	[1]	NA	NA
2,4-Dimethylphenol	ND	(0.100)	[1]	82.3	(1.07)	[1]	NA	NA
2,4-Dinitrophenol	ND	(0.343)	[1]	ND	(3.39)	[1]	NA	NA
2,4-Dinitrotoluene	ND	(0.0616)	[1]	ND	(0.608)	[1]	NA	NA
2,6-Dinitrotoluene	ND	(0.097)	[1]	ND	(0.958)	[1]	NA	NA
2-Chloronaphthalene	ND	(0.141)	[1]	ND	(1.39)	[1]	NA	NA
2-Chlorophenol	ND	(0.083)	[1]	ND	(0.82)	[1]	NA	NA
2-Methylnaphthalene	0.772	(0.0894)	[1]	152	(0.882)	[1]	NA	NA
2-Methylphenol	ND	(0.078)	[1]	21.7	(0.77)	[1]	NA	NA
2-Nitroaniline	ND	(0.141)	[1]	ND	(1.39)	[1]	NA	NA
2-Nitrophenol	ND	(0.0848)	[1]	ND	(0.836)	[1]	NA	NA
3,3'-Dichlorobenzidine	ND	(0.0661)	[1]	ND	(0.652)	[1]	NA	NA
3-Nitroaniline	ND	(0.105)	[1]	ND	(1.04)	[1]	NA	NA
4,6-Dinitro-2-methylphenol	ND	(0.12)	[1]	ND	(1.18)	[1]	NA	NA
4-Bromophenyl phenyl ether	ND	(0.108)	[1]	ND	(1.07)	[1]	NA	NA
4-Chloro-3-methylphenol	ND	(0.0816)	[1]	ND	(0.805)	[1]	NA	NA
4-Chlorophenyl phenyl ether	ND	(0.0704)	[1]	ND	(0.695)	[1]	NA	NA
4-Methylphenol/3-Methylphenol	ND	(0.0537)	[1]	70.2 F	(0.53)	[1]	NA	NA
4-Nitroaniline	ND	(0.134)	[1]	ND	(1.32)	[1]	NA	NA
4-Nitrophenol	ND	(0.342)	[1]	ND	(3.38)	[1]	NA	NA
Acenaphthene	ND	(0.0892)	[1]	1.27	(0.88)	[1]	NA	NA
Acenaphthylene	ND	(0.0778)	[1]	ND	(0.767)	[1]	NA	NA
Anthracene	ND	(0.0721)	[1]	ND	(0.712)	[1]	NA	NA
Benzo(a)anthracene	< DL	(0.0676)	[1]	< DL	(0.667)	[1]	NA	NA
Benzo(a)pyrene	ND	(0.0854)	[1]	< DL	(0.843)	[1]	NA	NA
Benzo(b)fluoranthene	0.0895 F	(0.0862)	[1]	< DL	(0.851)	[1]	NA	NA

Compiled: 22 June 1994

( ) = Detection Limit □ = Dilution Factor

ND = Not Detected

NA = Not Applicable

\* - Value considered suspect. Refer to QC Report

PARAMETER	9 E2 KRF-E2-U0002 0 - 2		9 E2 KRF-E2-U1012 10 - 12		9 E2 KRF-E2-U2628 26 - 28		9 E3 KRF-E3-U1416 14 - 16	
	1730		141		4440		1210	
18.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)	[1]	(32)	[1]	(33.7)	[1]	(147)	[5]	(32.1)
846 - Percent Moisture (percent)	[1]	(0)	[1]	(0)	[1]	(0)	[1]	(0)
Percent moisture								



9  
A2  
KRF-A2-U1618D  
16 - 18

9  
A2  
KRF-A2-U2022  
20 - 22

9  
A2  
KRF-A2-U2628  
26 - 28

9  
E1  
KRF-E1-U0002  
0 - 2

PARAMETER

SV8270 - Semivolatile Organics, cont. (ug/g)

Benzo(g,h,i)perylene	ND	(0.142)	[1]	ND	(1.41)	[1]	NA	NA
Benzo(k)fluoranthene	0.199 F	(0.138)	[1]	ND	(1.37)	[1]	NA	NA
Benzoic acid	ND	(3.28)	[1]	ND	(32.5)	[1]	NA	NA
Benzyl alcohol	ND	(0.0676)	[1]	ND	(0.671)	[1]	NA	NA
Butylbenzylphthalate	ND	(0.229)	[1]	ND	(2.27)	[1]	NA	NA
Chrysene	< DL	(0.125)	[1]	ND	(1.24)	[1]	NA	NA
Di-n-octylphthalate	ND	(0.0648)	[1]	ND	(0.642)	[1]	NA	NA
Dibenz(a,h)anthracene	ND	(0.126)	[1]	ND	(1.25)	[1]	NA	NA
Dibenzofuran	0.0843	(0.0696)	[1]	0.699	(0.691)	[1]	NA	NA
Dibutylphthalate	< DL	(0.0621)	[1]	ND	(0.616)	[1]	NA	NA
Diethylphthalate	ND	(0.0319)	[1]	ND	(0.316)	[1]	NA	NA
Dimethylphthalate	ND	(0.0563)	[1]	ND	(0.558)	[1]	NA	NA
Diphenylamine	ND	(0.113)	[1]	ND	(1.12)	[1]	NA	NA
Fluoranthene	0.308	(0.0741)	[1]	1.15	(0.735)	[1]	NA	NA
Fluorene	0.171	(0.0577)	[1]	0.762	(0.572)	[1]	NA	NA
Hexachlorobenzene	ND	(0.0692)	[1]	ND	(0.687)	[1]	NA	NA
Hexachlorobutadiene	ND	(0.13)	[1]	ND	(1.28)	[1]	NA	NA
Hexachlorocyclopentadiene	ND	(0.149)	[1]	ND	(1.48)	[1]	NA	NA
Hexachloroethane	ND	(0.0694)	[1]	ND	(0.688)	[1]	NA	NA
Indeno(1,2,3-cd)pyrene	ND	(0.111)	[1]	ND	(1.1)	[1]	NA	NA
Isophorone	ND	(0.0406)	[1]	ND	(0.403)	[1]	NA	NA
N-Nitroso-di-n-propylamine	ND	(0.0775)	[1]	ND	(0.768)	[1]	NA	NA
Naphthalene	0.337	(0.097)	[1]	23.4	(0.962)	[1]	NA	NA
Nitrobenzene	ND	(0.0552)	[1]	ND	(0.547)	[1]	NA	NA
Pentachlorophenol	ND	(0.12)	[1]	ND	(1.19)	[1]	NA	NA
Phenanthrene	0.352	(0.0829)	[1]	1.04	(0.823)	[1]	NA	NA
Phenol	ND	(0.0468)	[1]	1.19	(0.464)	[1]	NA	NA
Pyrene	0.213	(0.0889)	[1]	< DL	(0.882)	[1]	NA	NA
bis(2-Chloroethoxy)methane	ND	(0.0795)	[1]	ND	(0.788)	[1]	NA	NA
bis(2-Chloroethyl)ether	ND	(0.0613)	[1]	ND	(0.608)	[1]	NA	NA
bis(2-Chloroisopropyl)ether	ND	(0.0557)	[1]	ND	(0.552)	[1]	NA	NA
bis(2-Ethylhexyl)phthalate	8.73	(0.334)	[1]	4.08	(3.31)	[1]	NA	NA
p-Chloroaniline	ND	(0.118)	[1]	ND	(1.17)	[1]	NA	NA

SV846 - Percent Moisture (percent)

Percent moisture	20.1	(0)	[1]	22.9	(0)	[1]	9	(0)	[1]
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Compliled: 22 June 1994

( ) = Detection Limit [ ] = Dilution Factor ND = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to QC Report

9  
A2  
KRF-A2-U1618D  
16 - 18

9  
A2  
KRF-A2-U2022  
20 - 22

9  
A2  
KRF-A2-U2628  
26 - 28

9  
E1  
KRF-E1-U0002  
0 - 2

PARAMETER

18.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)	12600	(624)	[20]	21200	(646)	[20]	2730	(54.9)	[2]	352	(30.8)	[1]
Hydrocarbons												
8240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	ND	(98.6)	[50]	ND	(2050)	[1000]	NA			NA		NA
1,1,2,2-Tetrachloroethane	ND	(202)	[50]	ND	(4190)	[1000]	NA			NA		NA
1,1,2,2-Trichloroethane	ND	(120)	[50]	ND	(2500)	[1000]	NA			NA		NA
1,1-Dichloroethane	ND	(115)	[50]	ND	(2400)	[1000]	NA			NA		NA
1,1-Dichloroethane	ND	(163)	[50]	ND	(3380)	[1000]	NA			NA		NA
1,2-Dichloroethane	ND	(172)	[50]	ND	(3560)	[1000]	NA			NA		NA
1,2-Dichloropropane	ND	(107)	[50]	ND	(2230)	[1000]	NA			NA		NA
1-Chloroethyl vinyl ether	ND	(62.4)	[50]	ND	(1300)	[1000]	NA			NA		NA
2-Hexanone	ND	(193)	[50]	ND	(4000)	[1000]	NA			NA		NA
1-Methyl-2-Pentanone(MIBK)	ND	(167)	[50]	ND	(3460)	[1000]	NA			NA		NA
Acetone	ND	(260)	[50]	ND	(5400)	[1000]	NA			NA		NA
Benzene	< DL	(225)	[50]	< DL	(4660)	[1000]	NA			NA		NA
Bromodichloromethane	ND	(143)	[50]	ND	(2970)	[1000]	NA			NA		NA
Bromomethane	ND	(229)	[50]	ND	(4760)	[1000]	NA			NA		NA
Carbon disulfide	ND	(211)	[50]	ND	(4380)	[1000]	NA			NA		NA
Carbon tetrachloride	ND	(170)	[50]	ND	(3540)	[1000]	NA			NA		NA
Chlorobenzene	6430	(136)	[50]	35600	(2820)	[1000]	NA			NA		NA
Chloroethane	ND	(205)	[50]	ND	(4250)	[1000]	NA			NA		NA
Chloroform	ND	(90.5)	[50]	ND	(1880)	[1000]	NA			NA		NA
Chloromethane	ND	(174)	[50]	ND	(3620)	[1000]	NA			NA		NA
Dibromochloromethane	ND	(102)	[50]	ND	(2110)	[1000]	NA			NA		NA
Ethyl benzene	330	(149)	[50]	7280	(3100)	[1000]	NA			NA		NA
Methyl ethyl ketone	ND	(253)	[50]	ND	(5260)	[1000]	NA			NA		NA
Methylene Chloride	ND	(251)	[50]	ND	(5210)	[1000]	NA			NA		NA
Styrene	ND	(107)	[50]	ND	(2220)	[1000]	NA			NA		NA
Tetrachloroethene	ND	(161)	[50]	6470	(3340)	[1000]	NA			NA		NA
Toluene	< DL	(93.6)	[50]	102000	(1940)	[1000]	NA			NA		NA
Tribromomethane(Bromoform)	ND	(127)	[50]	ND	(2640)	[1000]	NA			NA		NA
Trichloroethene	ND	(121)	[50]	33900	(2510)	[1000]	NA			NA		NA
Vinyl Chloride	ND	(183)	[50]	ND	(3800)	[1000]	NA			NA		NA
Vinyl acetate	ND	(73.6)	[50]	ND	(1530)	[1000]	NA			NA		NA
Xylene (total)	776	(291)	[50]	57300	(6040)	[1000]	NA			NA		NA
cis-1,3-Dichloropropene	ND	(110)	[50]	ND	(2290)	[1000]	NA			NA		NA

Completed: 22 June 1994

( ) = Detection Limit [ ] = Dilution Factor

ND = Not Detected

NA = Not Applicable

\* - Value considered suspect. Refer to QC Report



9  
A2  
KRF-A2-U1012  
10 - 12

9  
A2  
KRF-A2-U1012D  
10 - 12

9  
A2  
KRF-A2-U1214  
12 - 14

9  
A2  
KRF-A2-U1618  
16 - 18

PARAMETER

W8240 - Volatile Organics, cont. (ug/kg)

trans-1,2-Dichloroethene	NA	NA	NA	ND	(421)	[200]
trans-1,3-Dichloropropene	NA	NA	NA	ND	(470)	[200]

W8270 - Semivolatile Organics (ug/g)

1,1,2,4-Trichlorobenzene	NA	NA	NA	ND	(0.0553)	[1]
1,2-Dichlorobenzene	NA	NA	NA	0.404	(0.0772)	[1]
1,3-Dichlorobenzene	NA	NA	NA	0.735	(0.0703)	[1]
1,4-Dichlorobenzene	NA	NA	NA	5.05	(0.092)	[1]
2,4,5-Trichlorophenol	NA	NA	NA	ND	(0.0691)	[1]
2,4,6-Trichlorophenol	NA	NA	NA	ND	(0.0824)	[1]
2,4-Dichlorophenol	NA	NA	NA	ND	(0.109)	[1]
2,4-Dimethylphenol	NA	NA	NA	ND	(0.101)	[1]
2,4-Dinitrophenol	NA	NA	NA	ND	(0.141)	[1]
2,4-Dinitrotoluene	NA	NA	NA	ND	(0.086)	[1]
2,6-Dinitrotoluene	NA	NA	NA	ND	(0.0937)	[1]
2-Chloronaphthalene	NA	NA	NA	ND	(0.0826)	[1]
2-Chlorophenol	NA	NA	NA	ND	(0.0711)	[1]
2-Methylnaphthalene	NA	NA	NA	2.13	(0.073)	[1]
2-Methylphenol	NA	NA	NA	ND	(0.0395)	[1]
2-Nitroaniline	NA	NA	NA	ND	(0.0928)	[1]
2-Nitrophenol	NA	NA	NA	ND	(0.0932)	[1]
3,3'-Dichlorobenzidine	NA	NA	NA	ND	(0.113)	[1]
3-Nitroaniline	NA	NA	NA	ND	(0.0979)	[1]
4,6-Dinitro-2-methylphenol	NA	NA	NA	ND	(0.123)	[1]
4-Bromophenyl phenyl ether	NA	NA	NA	ND	(0.0527)	[1]
4-Chloro-3-methylphenol	NA	NA	NA	ND	(0.0503)	[1]
4-Chlorophenyl phenyl ether	NA	NA	NA	ND	(0.0588)	[1]
4-Methylphenol/3-Methylphenol	NA	NA	NA	ND	(0.0458)	[1]
4-Nitroaniline	NA	NA	NA	ND	(0.137)	[1]
4-Nitrophenol	NA	NA	NA	ND	(0.146)	[1]
Acenaphthene	NA	NA	NA	ND	(0.0804)	[1]
Acenaphthylenc	NA	NA	NA	ND	(0.0796)	[1]
Anthracene	NA	NA	NA	ND	(0.0959)	[1]
Benzo(a)anthracene	NA	NA	NA	< DL	(0.0748)	[1]
Benzo(a)pyrene	NA	NA	NA	0.189 X	(0.0999)	[1]
Benzo(b)fluoranthene	NA	NA	NA	0.172 XF	(0.132)	[1]

9  
A1  
KRF-A1-U2728  
27 - 28

9  
A2  
KRF-A2-U0002  
0 - 2

9  
A2  
KRF-A2-U0204  
2 - 4

9  
A2  
KRF-A2-U0406  
4 - 6

PARAMETER

SW8270 - Semivolatile Organics, cont. (ug/g)

Benzo(g,h,i)perylene	ND	(1.11)	[1]	0.195	(0.0463)	[1]	0.196	(0.0477)	[1]	0.0591	(0.0463)	[1]
Benzo(k)fluoranthene	ND	(1.08)	[1]	1.03 F	(0.0451)	[1]	1.12 F	(0.0465)	[1]	0.422 F	(0.0451)	[1]
Benzoic acid	ND	(25.7)	[1]	ND	(1.07)	[1]	ND	(1.1)	[1]	ND	(1.07)	[1]
Benzy] alcohol	ND	(0.53)	[1]	ND	(0.0221)	[1]	ND	(0.0227)	[1]	ND	(0.0221)	[1]
Butylbenzylphthalate	ND	(1.8)	[1]	ND	(0.0748)	[1]	ND	(0.077)	[1]	ND	(0.0748)	[1]
Chrysene	ND	(0.976)	[1]	0.438	(0.0406)	[1]	0.59	(0.0418)	[1]	0.215	(0.0406)	[1]
Di-n-octylphthalate	ND	(0.508)	[1]	ND	(0.0211)	[1]	ND	(0.0218)	[1]	ND	(0.0211)	[1]
Dibenz(a,h)anthracene	ND	(0.986)	[1]	0.0662	(0.041)	[1]	0.09	(0.0423)	[1]	ND	(0.041)	[1]
Dibenzofuran	ND	(0.546)	[1]	0.041	(0.0227)	[1]	< DL	(0.0234)	[1]	ND	(0.0227)	[1]
Dibutylphthalate	ND	(0.487)	[1]	ND	(0.0203)	[1]	ND	(0.0209)	[1]	0.0431	(0.0203)	[1]
Diethylphthalate	ND	(0.25)	[1]	ND	(0.0104)	[1]	ND	(0.0107)	[1]	ND	(0.0104)	[1]
Dimethylphthalate	ND	(0.441)	[1]	ND	(0.0184)	[1]	ND	(0.0189)	[1]	ND	(0.0184)	[1]
Diphenylamine	ND	(0.886)	[1]	ND	(0.0369)	[1]	ND	(0.038)	[1]	ND	(0.0369)	[1]
Fluoranthene	ND	(0.581)	[1]	0.821	(0.0242)	[1]	1.16	(0.0249)	[1]	0.339	(0.0242)	[1]
Fluorene	ND	(0.452)	[1]	0.0356	(0.0188)	[1]	0.0544	(0.0194)	[1]	ND	(0.0188)	[1]
Hexachlorobenzene	ND	(0.543)	[1]	ND	(0.0226)	[1]	ND	(0.0233)	[1]	ND	(0.0226)	[1]
Hexachlorobutadiene	ND	(1.02)	[1]	ND	(0.0423)	[1]	ND	(0.0435)	[1]	ND	(0.0422)	[1]
Hexachlorocyclopentadiene	ND	(1.17)	[1]	ND	(0.0488)	[1]	ND	(0.0502)	[1]	ND	(0.0488)	[1]
Hexachloroethane	ND	(0.544)	[1]	ND	(0.0226)	[1]	ND	(0.0233)	[1]	ND	(0.0226)	[1]
Indeno(1,2,3-cd)pyrene	ND	(0.87)	[1]	0.183	(0.0362)	[1]	0.185	(0.0373)	[1]	0.0512	(0.0362)	[1]
Isophorone	ND	(0.318)	[1]	ND	(0.0132)	[1]	ND	(0.0136)	[1]	ND	(0.0132)	[1]
N-Nitroso-di-n-propylamine	ND	(0.607)	[1]	ND	(0.0253)	[1]	ND	(0.026)	[1]	ND	(0.0253)	[1]
Naphthalene	ND	(0.761)	[1]	ND	(0.0317)	[1]	ND	(0.0326)	[1]	ND	(0.0316)	[1]
Nitrobenzene	ND	(0.433)	[1]	ND	(0.018)	[1]	ND	(0.0185)	[1]	ND	(0.018)	[1]
Pentachlorophenol	ND	(0.938)	[1]	ND	(0.039)	[1]	ND	(0.0402)	[1]	ND	(0.039)	[1]
Phenanthrene	ND	(0.65)	[1]	0.393	(0.0271)	[1]	0.506	(0.0279)	[1]	0.13	(0.0271)	[1]
Phenol	ND	(0.367)	[1]	ND	(0.0153)	[1]	ND	(0.0157)	[1]	ND	(0.0153)	[1]
Pyrene	ND	(0.697)	[1]	0.652	(0.029)	[1]	0.911	(0.0299)	[1]	0.321	(0.029)	[1]
bis(2-Chloroethoxy)methane	ND	(0.623)	[1]	ND	(0.0259)	[1]	ND	(0.0267)	[1]	ND	(0.0259)	[1]
bis(2-Chloroethyl)ether	ND	(0.48)	[1]	ND	(0.02)	[1]	ND	(0.0206)	[1]	ND	(0.02)	[1]
bis(2-Chloroisopropyl)ether	ND	(0.436)	[1]	ND	(0.0182)	[1]	ND	(0.0187)	[1]	ND	(0.0182)	[1]
bis(2-Ethylhexyl)phthalate	< DL	(2.62)	[1]	1.32	(0.109)	[1]	0.126	(0.112)	[1]	0.686	(0.109)	[1]
p-Chloroaniline	ND	(0.926)	[1]	ND	(0.0385)	[1]	ND	(0.0397)	[1]	ND	(0.0385)	[1]

SW846 - Percent Moisture (percent)

Percent moisture	5.16	(0)	[1]	18.8	(0)	[1]	20.4	(0)	[1]	18.6	(0)	[1]
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Complied: 22 June 1994

( ) = Detection Limit [ ] = Dilution Factor ND = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to QC Report 326

9  
A1  
KRF-A1-U2728  
27 - 28

9  
A2  
KRF-A2-U0002  
0 - 2

9  
A2  
KRF-A2-U0204  
2 - 4

9  
A2  
KRF-A2-U0406  
4 - 6

PARAMETER

118.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)

2240	(52.6)	[2]	2330	(154)	[5]	203	(31.3)	[1]	1530	(30.6)	[1]
ND	(166)	[100]	ND	(1.94)	[1]	ND	(1.97)	[1]	ND	(1.93)	[1]
ND	(339)	[100]	ND	(5.26)	[1]	ND	(5.35)	[1]	ND	(5.25)	[1]
ND	(202)	[100]	ND	(1.58)	[1]	ND	(1.61)	[1]	ND	(1.58)	[1]
ND	(194)	[100]	ND	(1.78)	[1]	ND	(1.81)	[1]	ND	(1.77)	[1]
ND	(274)	[100]	ND	(2.66)	[1]	ND	(2.7)	[1]	ND	(2.66)	[1]
ND	(288)	[100]	ND	(1.8)	[1]	ND	(1.83)	[1]	ND	(1.8)	[1]
ND	(180)	[100]	ND	(2.72)	[1]	ND	(2.77)	[1]	ND	(2.72)	[1]
ND	(105)	[100]	ND	(2.97)	[1]	ND	(3.02)	[1]	ND	(2.96)	[1]
ND	(324)	[100]	ND	(0.995)	[1]	ND	(1.01)	[1]	ND	(0.992)	[1]
ND	(280)	[100]	ND	(0.949)	[1]	ND	(0.965)	[1]	ND	(0.947)	[1]
ND	(437)	[100]	7.63 B	(1.56)	[1]	12.3 B	(1.58)	[1]	7.79 B	(1.55)	[1]
ND	(378)	[100]	< DL	(1.79)	[1]	< DL	(1.82)	[1]	< DL	(1.79)	[1]
ND	(240)	[100]	ND	(1.69)	[1]	ND	(1.72)	[1]	ND	(1.69)	[1]
ND	(385)	[100]	ND	(2.09)	[1]	ND	(2.12)	[1]	ND	(2.08)	[1]
ND	(355)	[100]	ND	(2.69)	[1]	ND	(2.73)	[1]	ND	(2.68)	[1]
ND	(286)	[100]	ND	(2.07)	[1]	ND	(2.11)	[1]	ND	(2.07)	[1]
9160	(229)	[100]	8.38	(4.82)	[1]	8.39	(4.9)	[1]	7.6	(4.81)	[1]
ND	(344)	[100]	ND	(2.12)	[1]	ND	(2.16)	[1]	ND	(2.12)	[1]
ND	(152)	[100]	ND	(2.17)	[1]	ND	(2.21)	[1]	ND	(2.17)	[1]
ND	(293)	[100]	ND	(2.53)	[1]	ND	(2.57)	[1]	ND	(2.52)	[1]
ND	(171)	[100]	ND	(1.9)	[1]	ND	(1.93)	[1]	ND	(1.9)	[1]
< DL	(251)	[100]	ND	(1.72)	[1]	ND	(1.74)	[1]	ND	(1.71)	[1]
ND	(426)	[100]	13.7 B	(1.58)	[1]	13 B	(1.61)	[1]	12.8 B	(1.58)	[1]
ND	(422)	[100]	< DL	(2.71)	[1]	2.82	(2.75)	[1]	4.01	(2.7)	[1]
ND	(179)	[100]	ND	(1.68)	[1]	ND	(1.71)	[1]	ND	(1.68)	[1]
ND	(271)	[100]	ND	(4.93)	[1]	ND	(5.01)	[1]	ND	(4.92)	[1]
< DL	(157)	[100]	2.12	(1.77)	[1]	2.09	(1.79)	[1]	2.66	(1.76)	[1]
ND	(214)	[100]	ND	(1.57)	[1]	ND	(1.6)	[1]	ND	(1.57)	[1]
ND	(204)	[100]	ND	(5.04)	[1]	ND	(5.12)	[1]	ND	(5.03)	[1]
ND	(307)	[100]	ND	(2.15)	[1]	ND	(2.18)	[1]	ND	(2.14)	[1]
ND	(124)	[100]	ND	(11.4)	[1]	ND	(11.6)	[1]	ND	(11.3)	[1]
667	(489)	[100]	ND	(3.78)	[1]	ND	(3.84)	[1]	ND	(3.77)	[1]
ND	(186)	[100]	ND	(1.67)	[1]	ND	(1.69)	[1]	ND	(1.66)	[1]

Compiled: 22 June 1994

( ) = Detection Limit [ ] = Dilution Factor ND = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to QC Report

9  
AI  
KRF-A1-U0002  
0 - 2

9  
AI  
KRF-A1-U1618  
16 - 18

9  
AI  
KRF-A1-U1618D  
16 - 18

9  
AI  
KRF-A1-U1820  
18 - 20

PARAMETER

08270 - Semivolatile Organics, cont. (ug/g)

4-Chlorophenyl phenyl ether	ND	(0.0192)	[1]	NA	ND	(0.573)	[1]
4-Methylphenol/3-Methylphenol	ND	(0.015)	[1]	NA	0.922 F	(0.447)	[1]
4-Nitroaniline	ND	(0.0449)	[1]	NA	ND	(1.34)	[1]
4-Nitrophenol	ND	(0.0477)	[1]	NA	ND	(1.42)	[1]
Acenaphthene	0.0275	(0.0263)	[1]	NA	ND	(0.784)	[1]
Acenaphthylene	ND	(0.0261)	[1]	NA	ND	(0.776)	[1]
Anthracene	0.0405	(0.0314)	[1]	NA	< DL	(0.935)	[1]
Benzo(a)anthracene	0.303	(0.0245)	[1]	NA	< DL	(0.729)	[1]
Benzo(a)pyrene	0.295	(0.0327)	[1]	NA	ND	(0.974)	[1]
Benzo(b)fluoranthene	0.621 F	(0.0432)	[1]	NA	< DL	(1.29)	[1]
Benzo(g,h,i)perylene	0.169	(0.0465)	[1]	NA	ND	(1.38)	[1]
Benzo(k)fluoranthene	0.621 F	(0.0453)	[1]	NA	< DL	(1.35)	[1]
Benzoic acid	ND	(1.07)	[1]	NA	ND	(32)	[1]
Benzyl alcohol	ND	(0.0221)	[1]	NA	ND	(0.66)	[1]
Butylbenzylphthalate	ND	(0.075)	[1]	NA	ND	(2.24)	[1]
Chrysene	0.355	(0.0408)	[1]	NA	< DL	(1.21)	[1]
Di-n-octylphthalate	ND	(0.0212)	[1]	NA	ND	(0.632)	[1]
Dibenz(a,h)anthracene	0.0563	(0.0412)	[1]	NA	ND	(1.23)	[1]
Dibenzofuran	< DL	(0.0228)	[1]	NA	ND	(0.679)	[1]
Dibutylphthalate	ND	(0.0203)	[1]	NA	1.26	(0.606)	[1]
Diethylphthalate	ND	(0.0104)	[1]	NA	ND	(0.311)	[1]
Dimethylphthalate	ND	(0.0184)	[1]	NA	ND	(0.549)	[1]
Diphenylamine	ND	(0.037)	[1]	NA	ND	(1.1)	[1]
Fluoranthene	0.679	(0.0243)	[1]	NA	5.18	(0.723)	[1]
Fluorene	0.0231	(0.0189)	[1]	NA	ND	(0.562)	[1]
Hexachlorobenzene	ND	(0.0227)	[1]	NA	ND	(0.675)	[1]
Hexachlorobutadiene	ND	(0.0424)	[1]	NA	ND	(1.26)	[1]
Hexachlorocyclopentadiene	ND	(0.0489)	[1]	NA	ND	(1.46)	[1]
Hexachloroethane	ND	(0.0227)	[1]	NA	ND	(0.677)	[1]
Indeno(1,2,3-cd)pyrene	0.146	(0.0363)	[1]	NA	ND	(1.08)	[1]
Isophorone	ND	(0.0133)	[1]	NA	ND	(0.396)	[1]
N-Nitroso-di-n-propylamine	ND	(0.0254)	[1]	NA	ND	(0.756)	[1]
Naphthalene	ND	(0.0318)	[1]	NA	9.45	(0.946)	[1]
Nitrobenzene	ND	(0.0181)	[1]	NA	ND	(0.538)	[1]
Pentachlorophenol	ND	(0.0392)	[1]	NA	ND	(1.17)	[1]
Phenanthrene	0.223	(0.0272)	[1]	NA	3.07	(0.809)	[1]

Compiled: 22 June 1994

( ) = Detection Limit [ ] = Dilution Factor ND = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to QC Report:

TABLE A ALL RESULTS OF ORGANIC ANALYSES FOR SOIL SAMPLES, SITE '\*\*', RF Heating, Kelly AFB.

PARAMETER	SITE ID									
	LOCATION ID		SAMPLE ID		BEG. DEPTH - END DEPTH (FT.)		BEG. DEPTH - END DEPTH (FT.)		BEG. DEPTH - END DEPTH (FT.)	
	9 AI		9 AI		16 - 18		16 - 18		18 - 20	
458	KRF-A1-U0002		KRF-A1-U1618		KRF-A1-U1618D		KRF-A1-U1820			
	0 - 2		16 - 18		16 - 18		16 - 18		18 - 20	
458	(30.6)		(1650)		(1480)		(618)			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
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458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
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458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
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458	[1]		[50]		[50]		[50]			
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458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			
458	[1]		[50]		[50]		[50]			

APPENDIX M



Science Applications International Corporation  
An Employee-Owned Company

November 28, 1994

Clifton F. Blanchard  
Brown & Root Environmental  
Jackson Plaza, Suite A-600  
800 Oak Ridge Turnpike  
Oak Ridge, TN 37830

Re: EPA Contract No. 68-CO-0048, WA 0-49  
SAIC Project No. 01-0832-07-1123-014

Dear Cliff:

Peggy Groeber asked me to send you the enclosed final pretreatment soil and water data from the KAI RFH demonstration.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

A handwritten signature in cursive script, reading "Sharon Krietemeyer".

Sharon Krietemeyer  
Chemical Engineer

SMK/smk

Encl.

cc: M. Groeber (w/o enclosure)

smk:cliff.let

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extracti

Date	6/21/94	6/21/94	6/22/94	6/22/94	6/23/94	6/23/94	6/24/94
Time	8:56	17:43	8:28	16:14	7:48	18:42	19:10
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-6.0	-7.0	-6.0	-8.0	-7.0	-8.0	-6.0
E2	-7.0	-7.0	-6.0	-8.0	-7.0	-8.0	-6.0
E3	-7.0	-7.0	-6.0	-8.0	-7.0	-8.0	-7.0
E4	-0.8	-0.9	-0.9	-1.0	-0.9	-1.0	-0.9
E5	-0.7	-0.9	-0.9	-0.9	-0.8	-0.9	-1.0
E6	-0.8	-0.9	-0.8	-1.0	-0.9	-1.0	-0.4
E7	-0.5	-0.6	-0.6	-0.6	-0.5	-0.6	-0.6
E8	-0.8	-1.0	-1.1	-1.0	-0.9	-1.0	-1.1
HE	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.1
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	-0.5	-0.7	-0.5	-0.7	-0.6	-0.6	-0.5
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
TD6	-0.4	-0.6	-0.5	-0.6	-0.6	-0.7	-0.5
TD7	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
TD8	-0.1	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3
Suction	-11.0	-10.0	-12.0	-11.0	-12.0	-11.0	-12.0
Discharge	14.0	12.0	16.0	14.0	15.0	14.0	14.0
Compressor	387.5	387.5	387.5	387.5	387.5	415.2	387.5
Flare	11.1	11.1	11.1	11.1	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	40	40	40	40	40	40
Flare	65	60	60	60	70	70	65

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	46.1	45.9	45.4	45.4	44.9	44.8	44.3
A2	74.1	73.3	71.5	71.3	69.3	68.3	67.1

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	28.0	33.5	27.6	34.0	25.4	29.4	?
E1	34.7	34.7	31.8	36.6	31.5	36.3	34.6
E2	40.8	39.8	37.6	40.5	37.0	39.5	39.5
E3	39.7	38.4	37.8	40.7	35.0	9.3	38.6
E4	31.2	29.8	-	34.0	28.0	33.7	41.3
E5	32.0	32.1	-	35.4	-	33.8	33.9
E6	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-
E1,2,&3	33.4	36.1	32.3	37.1	30.8	35.4	35.2
E4&5	-	-	-	-	-	-	-
E6,7, &8	-	-	-	-	-	-	-
Christmas Tree	31.1	33.3	32.2	33.3	28.3	37.2	32.8
Mixed Vapor	32.2	40.0	32.2	40.6	26.7	37.8	36.7

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extracti

Date	6/9/94	6/10/94	6/10/94	6/10/94	6/11/94	6/11/94	6/12/94	6/12/94	6/13/94	6/13/94	6/14/94	6/14/94
Time	17:52	17:57	10:54	17:57	9:01	17:23	8:37	21:29	8:00	19:22	9:10	17:49
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.5	-0.6	-0.6		-0.5	-0.6	-1.0	-0.8	-0.8	-0.9	-0.9	-0.8
E2	-1.3	-1.8	-1.9		-1.6	-1.8	-2.6	-2.4	-2.3	-2.4	-2.3	-2.5
E3	-1.4	-3.2	-3.3		-3.0	-3.3	-4.7	-4.2	-4.1	-4.3	-4.1	-4.4
E4	-6.0	-6.0	-6.0	-49.0	-5.0	-6.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
E5	-6.0	-6.0	-6.0	-72.1	-5.0	-6.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
E6	-1.0	-1.3	-1.3		-1.0	-1.1	-1.7	-1.6	-1.6	-1.6	-1.5	-1.7
E7	-1.0	-1.3	-1.3		-1.3	-1.2	-2.0	-1.8	-1.8	-1.9	-1.8	-2.1
E8	-0.4	-0.8	-0.5		-2.6	-3.0	-4.0	-4.4	-4.4	-4.5	-4.3	-4.6
HE	-0.5	-0.7	-0.7		-0.6	-0.7	-1.0	-0.9	-0.9	-0.9	-0.9	-0.7
TD1	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	-0.1	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	-0.6	-1.3	-1.5		-1.0	-1.2	-1.8	-1.8	-1.7	-2.2	-1.5	-2.1
TD4	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.1	-0.4	-0.4		-0.3	-0.3	-0.4	-0.5	-0.7	-0.6	-0.6	-0.2
TD6	-0.6	-1.6	-1.3		-1.4	-1.3	-2.3	-2.2	-2.1	-2.3	-2.1	-2.7
TD7	-0.2	-0.2	-0.2		-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2
TD8	-0.4	-0.7	-0.7		-0.5	-0.6	-1.0	-0.9	-0.9	-0.9	-0.8	-1.0
Suction	-15.0	-16.0	-15.0		-16.0	-15.0	-19.0	-18.0	-19.0	-19.0	-18.0	-18.0
Discharge	20.0	19.0	19.0		20.0	19.0	25.0	24.0	24.0	24.0	24.0	24.0
Compressor	802.7	802.7	775.1		802.7	830.4	802.7	830.4	830.4	830.4	830.4	802.7
Flare	16.6	13.8	13.8		13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	45	50	50		50	50	50	50	50	55	50	55
Flare	95	90	90		90	90	95	90	105	105	105	100

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	64.9	59.6	60.4		60.0	58.8	60.0	58.6	57.5	56.6	54.7	54.2
A2	111.4	110.2	110.1		119.1	118.4	117.5	115.5	114.0	112.2	109.1	107.6

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	37.0	34.0	33.0		27.0	31.0	26.0	26.0	24.0	28.0	25.0	25.0
E1	-	-	-		-	-	-	-	-	-	-	-
E2	-	-	-		-	-	-	-	-	-	-	-
E3	-	-	-		-	-	-	-	-	-	-	-
E4	49.3	49.3	49.8		46.7	47.5	45.2	44.0	44.0	45.3	43.3	42.2
E5	75.2	73.9	73.1		63.3	63.9	61.6	59.0	57.3	58.4	54.1	51.8
E6	-	-	-		-	-	-	-	-	-	-	-
E7	-	-	-		-	-	-	-	-	-	-	-
E8	-	-	-		-	-	-	-	-	-	-	-
HE	-	-	-		-	-	-	-	-	-	-	-
E1,2,&3	-	-	-		-	-	-	-	-	-	-	-
E4&5	66.2	67.3	68.1		57.5	54.8	52.8	50.0	47.6	50.0	46.0	45.0
E6,7, &8	-	-	-		-	-	-	-	-	-	-	-
Christmas Tree	62.8	63.3	62.2		53.3	50.6	48.3	45.6	43.9	42.8	40.6	38.9
Mixed Vapor	54.4	51.7	51.7		40.6	40.6	40.6	37.8	35.0	36.7	33.3	29.4



TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extracti

Date	5/27/94	5/28/94	5/28/94	5/29/94	5/29/94	5/30/94	5/30/94	5/31/94	6/1/94	6/1/94	6/2/94	6/3/94
Time	16:45	8:41	18:25	10:10	17:22	8:55	19:14	17:28	10:18	19:37		10:05
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.3	-0.4	-0.4	-0.5	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5		-0.6
E2	-0.9	-1.0	-1.0	-1.0	-1.0	-1.0	-1.2	-1.3	-1.3	-1.3		-1.4
E3	-2.1	-1.9	-2.1	-2.3	-2.6	-2.1	-2.0	-1.6	-1.5	-1.5		-1.4
E4	-9.0	-9.0	-9.0	-8.5	-9.0	-8.0	-8.5	-7.5	-7.0	-7.0		-6.5
E5	-0.8	-9.5	-0.6	-11.5	-9.0	-7.5	-8.0	-7.5	-7.0	-7.2		-6.5
E6	-0.4	-0.6	-0.5	-0.8	-0.6	-0.6	-0.7	-0.8	-0.9	-1.1		-1.0
E7	-1.1	-1.3	-1.2	-1.2	-1.1	-1.0	-1.2	-1.0	-1.0	-1.1		-1.0
E8	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2		-0.2
HE	-8.5	-0.9	-1.1	-1.1	-0.7	-0.7	-0.7	-0.7	-0.6	-0.8		-0.6
TD1	0.0	> -0.1	0.0	> -0.1	0.0	> -0.1	0.0	0.0	0.0	> -0.1		0.0
TD2	0.0	> -0.1	0.0	> -0.1	0.0	> -0.1	0.0	> -0.1	> -0.1	> -0.1		0.0
TD3	-0.7	-0.8	-0.6	-0.7	-0.6	-0.7	-0.6	-0.8	-1.0	-0.7		-0.7
TD4	-0.1	> -0.1	0.0	> -0.1	0.0	> -0.1	0.0	> -0.1	0.0	0.0		0.0
TD5	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.5	-0.2	-0.1	-0.2		-0.2
TD6	-1.9	-1.6	-1.6	-1.7	-1.6	-1.6	-1.6	-1.2	-0.3	-1.1		-0.9
TD7	> -0.1	-0.1	> -0.1	> -0.1	> -0.1	> -0.1	> -0.1	-0.1	-0.7	-0.2		-0.1
TD8	-0.5	-0.6	-0.5	-0.6	-0.6	-0.2	> -0.1	-0.5	-0.5	-0.8		-0.8
Suction	-18.0	-25.0	-25.0	-19.0	-18.0	-18.0	-24.0	-17.0	-24.0	-16.0		-17.0
Discharge	24.0	28.0	28.0	22.0	21.0	22.0	28.0	28.0	28.5	20.0		22.0
Compressor	719.7	692.0	719.7	3460.1	3487.8	3460.1	719.7	719.7	636.7	3487.8		3543.2
Flare	16.6	16.6	16.6	13.8	13.8	16.6	16.6	16.6	13.8	16.6		16.6

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	45	50	50	52	50	50	45	50	50	45		45
Flare	90	90	85	90	95	95	95	95	95	115		95

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1		143.4	147.1	142.3	146.3	144.3	143.4	148.2	135.5	129.1		
A2		95.7	92.3	87.6	85.6	81.6	88.3	108.9	107.1	86.4		

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	-	26.0	24.0	27.0	36.0	26.0	35.0	36.0	31.0	31.0		
E1	-		-	-	-	-	-	-	-	-		-
E2	-		-	-	-	-	-	-	-	-		-
E3	-	-	-	-	-	-	-	-	-	-		-
E4	92.5	92.3	90.6	89.3	89.5	90.6	80.8	67.8	62.5	65.0		58.6
E5	93.3	57.2	57.7	56.2	57.1	55.6	62.7	65.3	67.5	65.6		66.3
E6	-	-	-	-	-	-	-	-	-	-		-
E7	-	-	-	-	-	-	-	-	-	-		-
E8	-	-	-	-	-	-	-	-	-	-		-
HE	-	-	-	-	-	-	-	-	-	-		-
E1,2,&3	-	-	-	-	-	-	-	-	-	-		-
E4&5	26.0	65.3	66.4	66.7	66.7	67.5	65.9	68.8	68.8	65.0		66.3
E6,7, &8	-	-	-	-	-	-	-	-	-	-		-
Christmas Tree	60.0	60.0	61.7	61.7	63.3	62.2	63.9	65.6	64.4	60.0		63.3
Mixed Vapor	47.8	46.1	47.8	47.8	48.9	48.9	46.1	51.7	51.7	46.1		48.9

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extracti

Date	5/15/94	5/16/94	5/16/94	5/17/94	5/17/94	5/18/94	5/18/94	5/19/94	5/19/94	5/20/94	5/20/94	5/21/94
Time	19:30	8:01	16:21	7:23	16:25	7:48	16:53	17:34	8:55	8:07	15:50	7:28
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	0.0	-0.1	-0.4	-0.3	-0.6	-0.6	-0.8	-1.1	-1.5	-0.4	-0.4	-0.4
E2	-30.0	-22.0	-30.0	-23.0	-30.0	23.0	-24.0	-30.0	-30.0	-12.0	-1.5	-1.8
E3	-30.0	-22.0	-30.0	-23.0	-30.0	-25.0	-24.0	-30.0	-30.0	-9.0	-1.6	-1.8
E4	-0.5	-0.5	-1.9	-1.4	-2.5	-2.6	-3.0	-4.2	-4.5	-1.8	-1.4	-1.5
E5	+	+	-30.0	-23.0	-30.0	-25.0	-21.0	-30.0	-30.0	-11.0	-11.0	-11.0
E6	-0.5	-0.4	-1.5	-1.2	-2.2	-2.0	-2.4	-3.1	-3.3	-1.2	-1.1	-1.1
E7	-0.5	-0.3	-1.7	-1.2	-2.3	-2.3	-2.6	-3.6	-3.8	-1.3	-1.3	-1.5
E8	0.0	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.
HE	0.0	0.0	-0.2	-0.2	-0.4	-0.9	-1.3	-2.0	-2.1	-0.7	-0.8	-0.8
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
TD5	0.0	0.0	-0.2	-0.2	-0.3	-0.3	-1.0	-1.1	-1.0	-0.3	-0.2	-0.4
TD6	-0.1	-0.1	-1.8	-1.2	-2.3	-2.3	-3.0	-3.9	-4.2	-1.4	-1.5	-1.8
TD7	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	0.0	-0.1	-0.1
TD8	0.0	0.0	-0.4	-0.3	-0.8	-1.0	-1.2	-1.7	-1.8	-0.6	-0.6	-0.5
Suction	-46.0	-38.0	-47.0	-28.0	-42.0	-34.0	-33.0	-42.0	-43.0	-24.0	-22.0	-20.0
Discharge	50.0	39.0	50.0	30.0	43.0	36.0	35.0	-46.0	48.0	26.0	23.0	23.0
Compressor	387.5	249.1	1439.4	553.6	1245.6	1245.6	1079.6	1910.0	2048.4	581.3	553.6	664.3
Flare	11.1	8.3	13.8	22.1	22.1	22.1	8.3	22.1	16.6	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	35	60	45	55	60	50	70	60	40	40	50
Flare	60	60	95	70	85	90	110	130	140	90	85	85

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	23.0	23.3	23.1	23.7	23.8	23.9	24.0	24.5	24.5	24.4	24.3	110.1
A2	145.2	143.7	126.6	120.1	124.6	110.5	106.8	115.6	121.0	201.5	223.5	179.2

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	26.0	22.0	25.0	22.0	32.0	23.0	33.0	20.0	32.0	21.0	32.0	19.0
E1	-	-	-	-	-	-	-	-	-	21.1	-	19.8
E2	56.0	60.7	54.2	42.6	44.2	37.6	38.8	34.2	34.7	32.6	30.8	19.8
E3	25.1	27.0	28.8	23.5	41.7	26.7	43.5	27.0	45.3	27.3	34.4	22.6
E4	-	-	-	-	-	-	-	-	-	23.5	35.8	24.5
E5	-	-	87.0	85.4	82.6	78.2	74.3	74.5	75.7	74.4	86.6	86.6
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	32.8	39.5	47.7	35.6	44.2	34.5	39.1	30.1	37.5	28.6	44.7	23.9
E4&5	-	-	-	86.8	82.5	77.3	71.1	70.5	70.3	73.5	73.2	68.6
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	29.4	21.1	80.0	77.8	74.4	70.0	63.9	62.8	62.8	64.4	65.6	58.9
Mixed Vapor	28.3	20.0	61.7	63.3	63.3	52.8	51.7	48.9	51.7	47.8	51.7	43.3

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

## Vapor Extracti

Date	5/3/94	5/4/94	5/4/94	5/5/94	5/5/94	5/6/94	5/6/94	5/7/94	5/7/94	5/8/94	5/8/94	5/9/94
Time	18:24	9:36	18:00	7:00	17:17	9:23	16:54	11:20	18:10	8:43	15:14	8:35
Well Number	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)
E1	0.0	-0.4	-0.4	-0.4	-0.5	-0.3	-0.1	-0.4	-0.5	-0.5	-0.5	-0.4
E2	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	0.1	-0.7	-0.7	-0.8	-0.9	-0.7	-0.9	-1.0	-1.3	-1.5	-1.7	-1.0
E4	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E5	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E6	-1.6	-1.3	-1.3	-1.3	-1.7	-1.2	-1.7	-1.4	-1.7	-1.6	-1.9	-1.5
E7	-1.4	-1.3	-1.3	-1.3	-1.5	-1.1	-1.4	-1.4	-1.7	-1.6	-1.9	-1.5
E8	-0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0
HE	0.0	0.0	-0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.2	-0.2	-0.3	-0.2
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	-0.1	-1.0	-1.0	-0.9	-1.3	-0.9	-1.3	-1.0	-1.2	-0.1	0.0	0.0
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	0.0	-0.1	-0.1	-0.1	0.0	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2
TD6	-0.5	-0.3	-0.4	-0.3	-0.5	-0.3	-0.4	-0.5	-0.8	-0.9	-1.1	-0.6
TD7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD8	-0.3	-0.2	-0.3	-0.3	-0.4	-0.3	-0.4	-0.3	-0.5	-0.5	-0.6	-0.4
Suction	-40.0	-38.0	-42.0	-38.0	-39.0	-38.0	-39.0	-36.0	-38.0	-36.0	-34.0	-34.0
Discharge	42.0	40.0	39.0	40.0	37.0	37.0	41.0	39.0	40.0	38.0	36.0	36.0
Compressor	415.2	415.2	442.9	415.2	442.9	415.2	442.9	415.2	442.9	387.5	415.2	415.2
Flare	11.1	11.1	11.1	11.1	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8

## Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	40	40	40	40	40	40	40	40	40	40	40
Flare	60	60	60	60	60	60	60	60	60	60	60	60

## Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	18.3	18.6	18.8	18.6	18.9	19.1	18.9	19.3	19.3	19.7	19.7	19.8
A2	115.4	134.9	97.5	110.2	128.1	124.4	134.5	99.7	95.4	94.0	89.7	125.9

## Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	23.0	18.0	24.0	20.0	27.0	23.0	28.0	27.0	32.0	25.0	30.0	24.0
E1	-	-	-	-	-	-	-	-	-	-	-	-
E2	23.7	21.3	27.0	25.1	29.5	29.9	33.0	33.1	33.7	32.5	35.7	31.2
E3	-	-	-	-	-	-	-	-	-	-	-	-
E4	18.1	22.1	28.1	25.3	31.6	30.1	35.3	34.2	37.4	34.3	40.5	33.5
E5	90.6	93.5	86.3	91.2	85.6	82.6	85.5	77.2	72.3	64.3	63.5	89.5
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	26.7	22.6	27.8	24.6	30.7	29.8	33.7	33.7	34.3	31.5	36.6	30.9
E4&5	57.6	63.0	59.6	65.4	64.8	64.7	70.4	65.2	62.2	53.1	54.8	77.9
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	28.3	20.6	35.6	29.4	36.1	38.9	47.2	46.1	46.7	37.8	43.3	56.7
Mixed Vapor	23.3	15.6	26.1	18.9	40.6	23.9	34.4	32.2	35.0	27.2	35.0	35.0

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extraction System

Date	4/22/94	4/23/94	4/23/94	4/24/94	4/24/94	4/24/94	4/25/94	4/25/94	4/25/94	4/26/94	4/26/94	4/26/94
Time	14:41	14:02	9:23	8:12	14:00	20:04	8:00	13:24	18:35	8:03	12:54	16:50
Well Number	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)	Pressure (° H <sub>2</sub> O)
E1	-1.0	-0.5	-0.5	-0.5	-1.0	-1.0	-1.0	-1.0	-0.5	-0.5	-1.0	-1.0
E2	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	-2.0	-1.0	-1.0	-1.0	-2.0	-1.5	-1.5	-2.0	-1.0	-1.5	-1.0	-1.0
E4	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E5	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E6	-3.0	-1.5	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
E7	-2.5	-1.5	-1.5	-2.5	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.5
E8	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	0.0	0.0	0.0
HE	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	-2.0	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD6	-2.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-0.5	-1.0	-1.0
TD7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD8	-1.5	-0.5	-0.5	-1.0	-1.0	-0.5	-1.0	-1.0	-0.5	-0.5	-0.5	-0.5
Suction	-40.0	-42.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0
Discharge	41.0	45.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	41.0	41.0
Compressor	664.3	442.9	442.9	470.6	470.6	470.6	442.9	442.9	442.9	442.9	442.9	442.9
Flare	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	50	40	40	40	40	40	40	40	40	40	40	40
Flare	60	60	50	60	60	60	60	60	60	60	60	60

Radio Frequency System

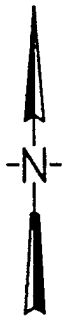
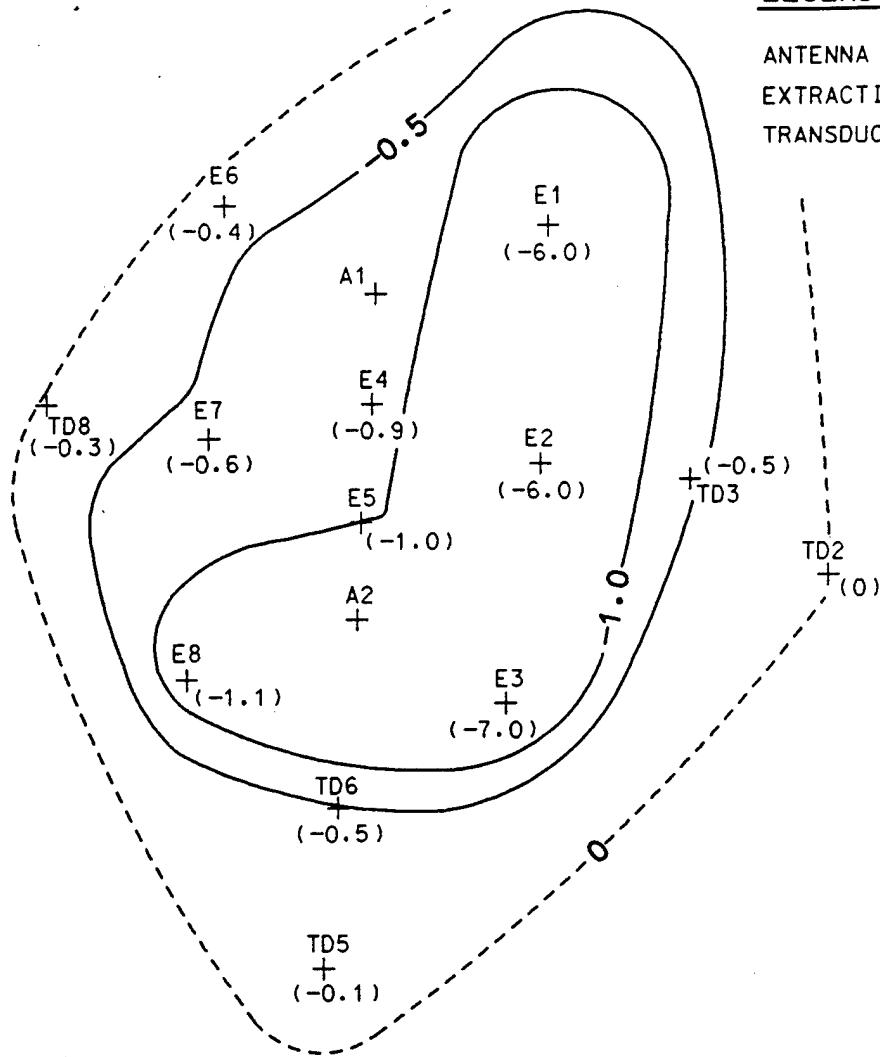
Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	-	-	-	-	-	-	17.2	17.1	-	17.0	17.2	17.4
A2	-	-	-	-	-	-	95.1	95	-	95.0	113.5	95.7

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	30.6	27.8	23.4	19.4	27.1	26.8	22.1	26.0	30.0	23.0	31.0	33.0
E1	30.1	-	-	18.9	-	24.1	21.1	25.3	28.3	21.3	36.0	-
E2	29.3	29.1	22.3	21.8	28.1	26.5	22.8	25.6	28.5	23.2	31.1	31.5
E3	30.7	-	-	19.4	29.2	25.1	21.4	26.3	29.0	22.7	34.1	-
E4	29.4	27.9	21.9	21.7	27.3	26.8	22.9	25.7	29.0	23.3	32.3	32.8
E5	31.5	29.3	23.3	24.2	27.9	28.2	26.3	35.5	48.5	50.8	56.7	52.5
E6	31.7	-	-	19.5	-	24.3	21.8	23.7	25.7	21.7	-	-
E7	31.3	-	-	19.5	-	24.3	21.6	24.0	26.5	22.0	-	-
E8	31.4	-	-	19.7	-	25.0	21.9	25.1	28.3	23.1	-	-
HE	25.8	-	-	19.9	24.7	23.3	21.3	24.4	26.3	23.0	-	-
E1,2,&3	33.8	28.9	23.3	20.8	-	25.3	22.1	26.5	31.1	23.7	36.3	33.8
E4&5	31.9	27.9	22.1	21.6	-	25.2	23.1	27.0	32.7	31.4	39.3	38.0
E6,7, &8	33.4	-	-	19.1	-	25.6	21.6	26.1	29.7	23.1	-	-
Christmas Tree	36.1	28.3	23.3	18.9	27.8	28.9	22.2	26.7	33.9	23.3	32.2	37.8
Mixed Vapor	37.2	32.8	23.3	18.9	30.0	26.1	21.1	26.7	32.8	21.7	34.4	35.6

# LEGEND

ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



6 0 6  
SCALE IN FEET

TD4  
+  
(0)

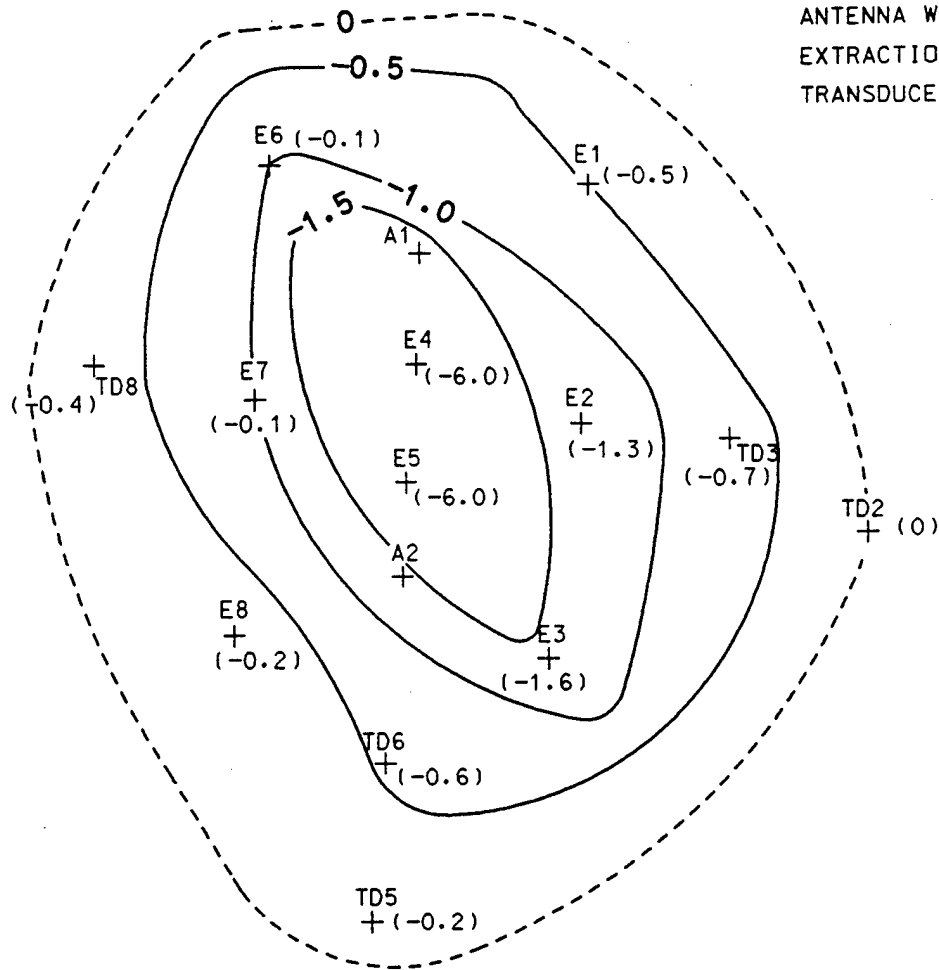
## NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

DRAWN CHECKED GEOLOGIST ENGINEER DISC. MAN. PROJ. MAN.	TITLE <b>SUBSURFACE PRESSURES FOR          JUNE 24, 1994          KAI DEMONSTRATION          RADIO FREQUENCY HEATING          DECONTAMINATION DEMONSTRATION          SITE S-1          KELLY AIR FORCE BASE, TEXAS</b>		
	SCALE	AS SHOWN	DATE
	DRAWING NO.	3688G016	REV. 0
	SHEET 1 OF 1		

# LEGEND

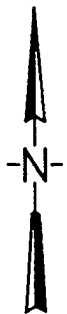
ANTENNA WELL                    A  
 EXTRACTION WELL            E  
 TRANSDUCER WELL            TD



TD4  
 +  
 (0)

## NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.



6      0      6  
 SCALE IN FEET

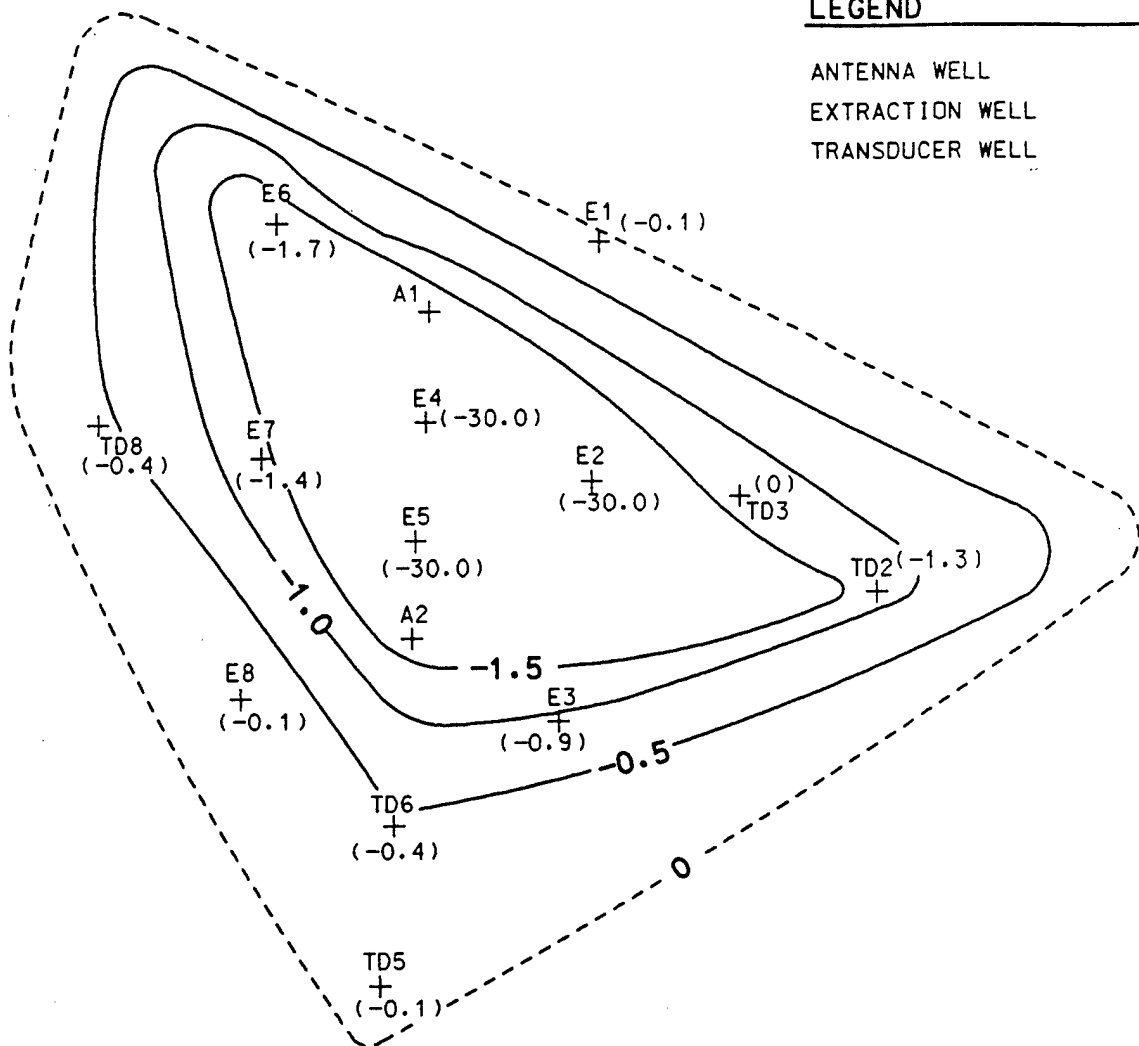
DRAWN
CHECKED
GEOLOGIST
ENGINEER
DISC. MAN.
PROJ. MAN.

TITLE      **SUBSURFACE PRESSURES FOR  
 JUNE 7, 1994  
 KAI DEMONSTRATION  
 RADIO FREQUENCY HEATING  
 DECONTAMINATION DEMONSTRATION  
 SITE S-1  
 KELLY AIR FORCE BASE, TEXAS**

SCALE      AS SHOWN	DATE      12-6-94
DRAWING NO.      3688G016	REV. 0      SHEET 1 OF 1

# LEGEND

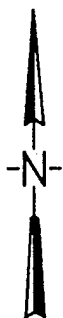
ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



TD4  
+ (0)

## NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.
3. THE 0 VALUE AT TD3 WAS IGNORED FOR THESE CONTOURS.



6 0 6  
SCALE IN FEET

DRAWN CHECKED GEOLOGIST ENGINEER DISC. MAN. PROJ. MAN.	TITLE SUBSURFACE PRESSURES FOR MAY 6, 1994 KAI DEMONSTRATION RADIO FREQUENCY HEATING DECONTAMINATION DEMONSTRATION SITE S-1 KELLY AIR FORCE BASE, TEXAS		
	SCALE	AS SHOWN	DATE
	DRAWING NO.	3688G016	REV. 0
	SHEET 1 OF 1		

## PERMEABILITY CALCULATIONS

Input data into Equation:

$$k = \frac{Q \mu [\ln(R_w / R_i)]}{H \pi P_w [1 - (P_{ATM} / P_w)^2]}$$

$$k = \frac{(31.7 \text{ ASCFM}) (4.6 \times 10^{-7} \text{ lb} \cdot \text{s} / \text{ft}^2) [\ln(0.167 \text{ ft} / 9 \text{ ft})]}{(27 \text{ ft}) \pi (1872 \text{ lb} / \text{ft}^2) \left[ 1 - \left( \frac{2072 \text{ lb} / \text{ft}^2}{1872 \text{ lb} / \text{ft}^2} \right)^2 \right]} \left( \frac{1 \text{ min}}{60 \text{ s}} \right)$$

$$k = \underline{2.7\text{E-}11 \text{ ft}^2}$$

Convert Vapor Permeability, k in ft<sup>2</sup> to cm<sup>2</sup>:

$$K = k \left( \frac{9.29 \times 10^2 \text{ cm}^2}{\text{ft}^2} \right)$$

$$K = 9.7 \times 10^{-11} \left( \frac{9.29 \times 10^2 \text{ cm}^2}{\text{ft}^2} \right)$$

$$k = \underline{2.5\text{E-}08 \text{ cm}^2}$$

Convert Vapor Permeability, k in ft<sup>2</sup> to darcy:

$$K = k \left( \frac{9.42 \times 10^{10} \text{ cm}^2}{\text{ft}^2} \right)$$

$$K = 9.7 \times 10^{-11} \left( \frac{9.42 \times 10^{10} \text{ cm}^2}{\text{ft}^2} \right)$$

$$K = \underline{2.6 \text{ darcy}}$$

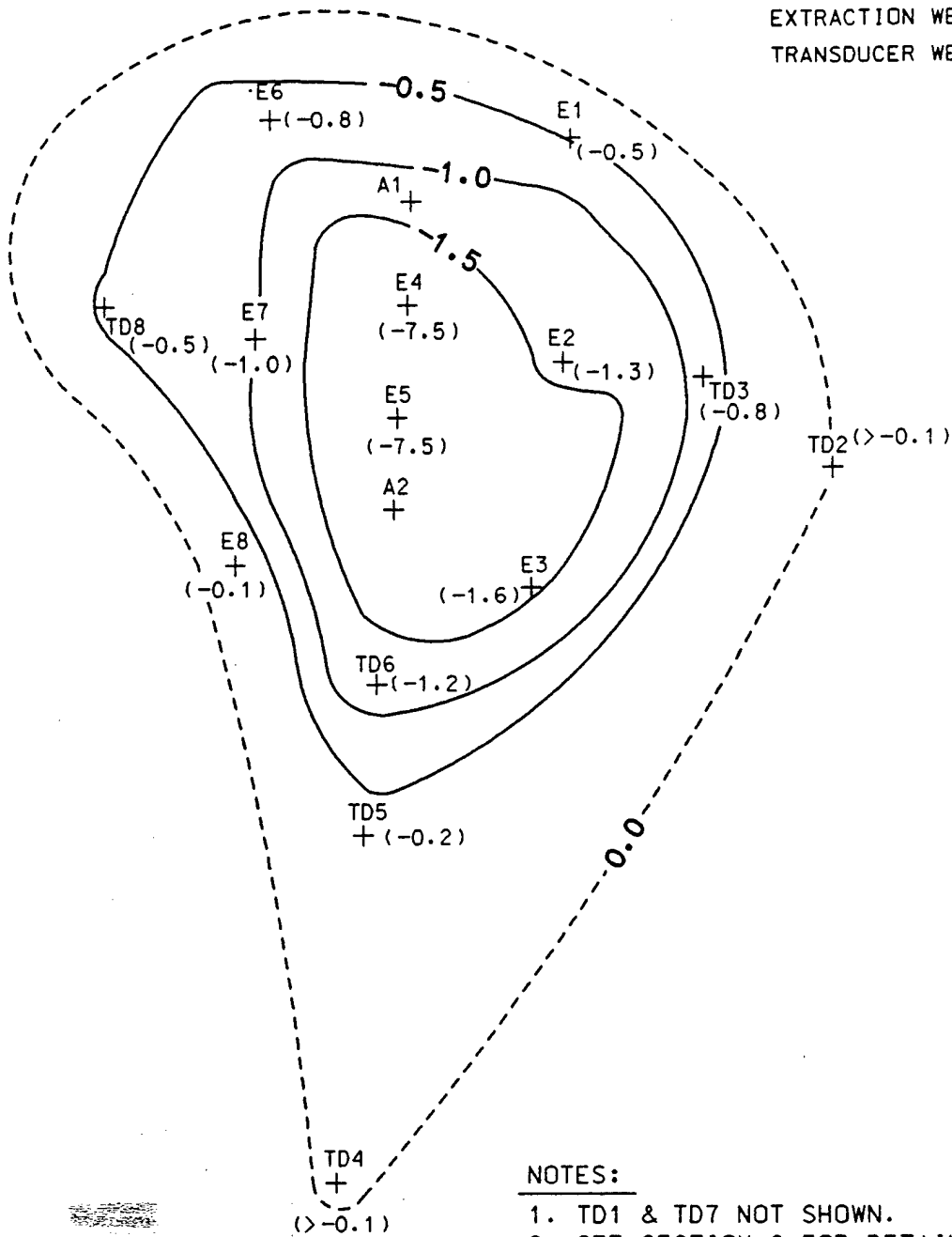
Spreadsheet Calculation for Other Dates:

Data from Demonstration	4/8/94	5/6/94	5/31/94	6/7/94	6/14/94	6/24/94
Flow Rate, Q, (ASCFM)	54.0	31.7	71.4	66.2	75.7	47.5
Number of Wells	2	3	2	2	2	3
Well Radius, R <sub>w</sub> , (ft.)	0.167	0.167	0.167	0.167	0.167	0.167
Total Screen Length, H, (ft.)	18	27	18	18	18	27
Differential Pressure at Wells, V, (in. H <sub>2</sub> O)	-40	-38.5	-7.5	-6.0	-8.0	-6.33
Absolute Pressure at Wells, P <sub>w</sub> , (lb/ft <sup>2</sup> )	1864	1872	2026	2020	2024	2025
Barometric Pressure (In. Hg)	29.3	29.3	29.2	29.0	29.2	29.1
Atmospheric Pressure, P <sub>ATM</sub> , (lb/ft <sup>2</sup> )	2072	2072	2065	2051	2065	2058
Radius of Influence, R <sub>i</sub> , (ft.)	7	9	10	9	12	8
Vapor Temperature (°F)	105	126	157	157	100	116
Estimated Vapor Viscosity, μ (lb·s/ft <sup>2</sup> )	4.4E-07	4.6E-07	4.8E-07	4.8E-07	4.4E-07	4.5E-07
Estimated Vapor Permeability, k, (ft <sup>2</sup> )	6.4E-11	2.7E-11	5.1E-10	5.9E-10	4.7E-10	2.5E-10
Estimated Vapor Permeability, k, (cm <sup>2</sup> )	5.9E-08	2.5E-08	4.7E-07	5.5E-07	4.3E-07	2.3E-07
Estimated Vapor Permeability, k, (darcy)	6.0	2.6	48.2	55.9	43.8	23.7



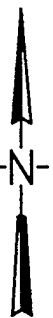
# LEGEND

ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



## NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

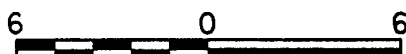
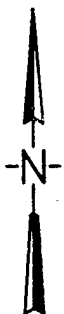
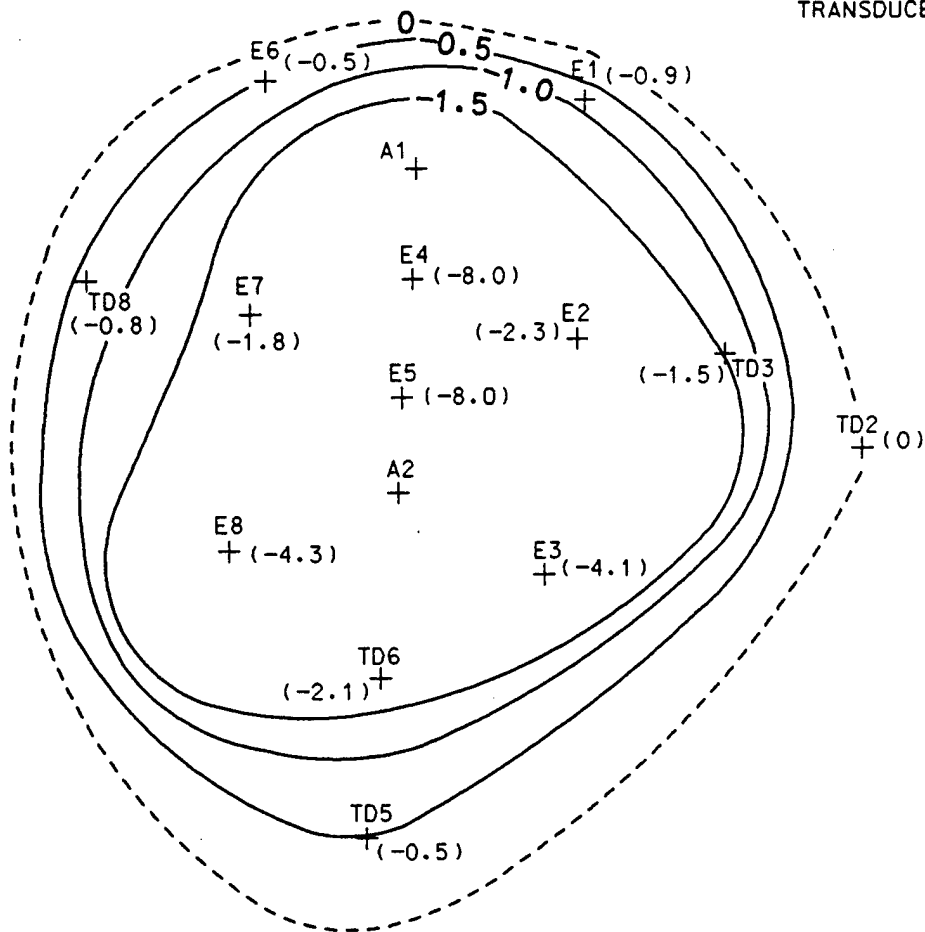


6 0 6  
SCALE IN FEET

DRAWN		TITLE	
CHECKED		SUBSURFACE PRESSURES FOR	
GEOLOGIST		MAY 31, 1994	
ENGINEER		KAI DEMONSTRATION	
		RADIO FREQUENCY HEATING	
		DECONTAMINATION DEMONSTRATION	
		SITE S-1	
		KELLY AIR FORCE BASE, TEXAS	
DISC. MAN.		SCALE	DATE
PROJ. MAN.		AS SHOWN	12-6-94
		DRAWING NO.	REV. 0
		3688G016	SHEET 1 OF 1

# LEGEND

ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



SCALE IN FEET

TD4  
+  
(0)

## NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

	DRAWN	<b>TITLE</b> <b>SUBSURFACE PRESSURES FOR</b> <b>JUNE 14, 1994</b> <b>KAI DEMONSTRATION</b> <b>RADIO FREQUENCY HEATING</b> <b>DECONTAMINATION DEMONSTRATION</b> <b>SITE S-1</b> <b>KELLY AIR FORCE BASE, TEXAS</b>						
	CHECKED							
	GEOLOGIST							
	ENGINEER							
	DISC. MAN.	SCALE	AS SHOWN	DATE	12-6-94			
	PROJ. MAN.	DRAWING NO.	3688G016	REV.	0	SHEET	1	OF

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extracti

Date	4/27/94	4/27/94	4/27/94	4/28/94	4/28/94	4/29/94	4/29/94	4/30/94	5/1/94	5/2/94	5/2/94	5/3/94
Time	8:18	13:29	17:12	7:57	15:52	11:20	17:34	18:44	10:52	12:17	19:10	14:00
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.5	-0.7	-0.6	-0.5	0.0	0.0	-0.5	-0.7	-0.4	-0.3	-0.3	-0.4
E2	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	-1.0	-1.8	-1.4	-1.3	-1.3	-2.1	-1.3	-2.0	-1.3	-1.3	-0.9	-0.9
E4	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E5	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E6	-2.0	-2.3	-2.2	-2.0	-1.5	-2.3	-1.6	-2.3	-1.4	-1.5	-1.3	-1.5
E7	-1.0	0.0	-2.3	-2.0	-2.3	-2.7	0.0	-2.5	-1.8	-1.7	-1.3	-1.4
E8	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0
HE	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	+	0.0	0.0	0.0	-0.1
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+	0.0
TD2	-1.0	-1.7	-1.4	-0.1	-1.3	-2.7	-1.2	-1.7	-1.2	-1.0	-0.9	-1.0
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
TD6	-0.5	-1.0	-0.7	-0.7	-0.9	-1.1	-0.9	-1.3	-0.9	-0.8	-0.6	-0.5
TD7	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3
TD8	-0.5	-0.7	-0.6	-0.5	-0.5	-0.5	-0.4	-0.6	-0.4	-0.3	-0.3	0.0
Suction	-43.0	-41.0	-40.0	-41.0	-46.0	-46.0	-39.0	-38.0	-39.0	-45.0	-33.0	-40.0
Discharge	45.0	43.0	43.0	43.0	48.0	48.0	38.0	39.0	41.0	48.0	35.0	43.0
Compressor	498.3	498.3	498.3	470.6	498.3	498.3	415.2	415.2	415.2	415.2	276.8	415.2
Flare	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	11.1	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	40	40	40	40	40	40	40	40	40	40	40
Flare	60	60	60	60	60	60	60	60	60	60	60	60

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	17.1	17.1	17.3	17.1	17.2	17.5	17.5	17.7	17.5	18.0	18.1	18.2
A2	114.0	105.6	109.4	102.8	107.0	104.6	96.5	72.4	69.4	99.5	95.1	104.4

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	24.0	24.0	30.0	24.0	25.0	23.0	21.0	18.0	14.0	21.0	21.0	28.0
E1	-	27.5	-	-	-	-	-	-	-	-	-	-
E2	24.1	28.1	29.0	23.4	24.0	26.4	29.0	23.6	20.1	21.1	22.6	28.5
E3	-	28.6	-	-	-	29.8	-	-	-	-	-	-
E4	24.7	28.8	30.0	24.6	23.5	26.0	28.5	23.4	20.2	21.0	20.1	29.7
E5	56.7	51.6	58.3	56.5	56.4	64.6	62.1	37.2	36.8	62.3	40.7	92.1
E6	-	27.7	-	-	-	-	-	-	-	-	-	-
E7	-	28.6	-	-	-	-	-	-	-	-	-	-
E8	-	28.6	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	24.8	30.8	30.5	24.6	25.0	27.8	29.7	20.1	18.0	21.0	21.4	33.8
E4&5	36.3	36.2	40.1	37.3	31.7	43.2	42.6	22.8	21.7	29.5	22.8	59.5
E6,7, &8	-	30.7	-	-	-	-	-	-	-	-	-	-
Christmas Tree	25.0	31.1	31.1	25.0	26.1	30.0	33.3	19.4	13.3	18.9	23.3	35.0
Mixed Vapor	23.3	15.6	30.0	22.8	26.7	26.7	32.2	18.3	13.3	19.4	21.1	31.1

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extracti

Date	5/9/94	5/10/94	5/10/94	5/11/94	5/11/94	5/12/94	5/12/94	5/13/94	5/13/94	5/14/94	5/14/94	5/15/94
Time	17:40	8:35	16:25	10:04	17:11	7:41	16:45	7:33	18:08	7:56	18:17	10:52
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.8	-0.7	-0.7	-0.1	-0.2	-0.1	-0.1
E2	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E4	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-0.5	-1.0	-0.5	-0.4
E5	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-0.5	0.0	-0.5	+
E6	-1.8	-1.8	-1.9	-2.1	-1.7	-2.5	-2.5	-2.3	-0.5	-0.8	-0.5	-0.5
E7	-1.7	-1.7	-1.9	-2.2	-1.7	-2.5	-2.5	-2.4	-0.5	-0.6	-0.5	-0.3
E8	0.0	0.0	0.0	-0.1	0.0	-0.1	atm.	atm.	atm.	0.0	atm.	atm.
HE	-0.2	-0.1	-0.1	-0.3	-0.3	-0.7	-0.7	-0.8	+	0.0	0.0	+
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	0.0	0.0	0.0	-0.3	-0.1	-0.2	0.0	-0.1	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.2	-0.2	-0.2	-0.3	-0.2	-0.3	-0.8	-0.3	-0.1	-0.1	0.0	-0.1
TD6	-0.9	-0.9	-1.0	-1.6	-1.0	-1.7	-1.7	-1.8	-0.4	-0.3	-0.1	0.0
TD7	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
TD8	-0.5	-0.5	-0.5	-0.8	-0.5	-1.0	-1.0	-0.9	-0.2	-0.2	0.0	0.0
Suction	-36.0	-36.0	-38.0	-37.0	-31.0	-40.0	-38.0	-34.0	-45.0	-45.0	-45.0	-45.0
Discharge	38.0	34.0	39.0	38.0	33.0	42.0	40.0	36.0	48.0	48.0	48.0	49.0
Compressor	470.6	498.3	525.9	609.0	470.6	1024.2	996.5	1190.3	387.5	387.5	387.5	387.5
Flare	13.8	16.6	13.8	16.6	13.8	19.4	19.4	19.4	13.8	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	45	45	45	45	40	50	60	40	40	40	45
Flare	60	65	65	65	65	80	85	85	60	60	60	60

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	19.9	20.1	20.3	20.5	20.6	21.0	20.9	21.3	21.4	22.1	21.8	22.5
A2	130.3	134.1	139.4	115.6	137.0	128.1	126.4	121.5	116.8	142.4	137.8	143.4

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	30.0	24.0	30.0	24.0	28.0	23.0	28.1	23.1	19.0	30.0	17.0	30.0
E1	-	-	-	-	-	-	-	-	-	-	-	-
E2	34.3	31.8	34.0	31.7	33.1	29.4	32.0	30.1	27.1	43.3	28.4	47.6
E3	34.3	26.3	34.3	27.4	30.7	25.2	33.7	25.8	24.6	30.6	20.3	29.6
E4	38.7	33.8	37.5	35.3	35.3	34.2	37.8	33.5	-	-	-	-
E5	88.3	88.5	88.5	72.7	84.2	75.5	77.3	76.8	-	-	-	-
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	35.0	30.1	35.6	31.1	32.7	29.0	32.1	29.0	23.7	36.9	21.8	36.0
E4&5	78.7	79.6	80.6	66.1	78.1	71.3	73.3	73.3	-	-	-	-
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	61.1	62.2	63.9	48.9	62.2	58.3	62.2	62.2	19.4	35.0	16.7	26.7
Mixed Vapor	44.4	42.2	46.1	32.2	44.4	40.6	46.1	45.6	18.3	37.8	18.3	35.0

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extracti

Date	5/21/94	5/22/94	5/22/94	5/23/94	5/23/94	5/24/94	5/24/94	5/25/94	5/25/94	5/26/94	5/26/94	5/27/94
Time	18:03	8:56	17:43	8:30	18:41	9:13	16:44	9:54	16:14	8:06	17:52	
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.4	-0.3	-17.0	-13.0	-0.3	-0.3	-0.2	-0.2	-0.3	-	-	
E2	-1.8	-1.3	-17.0	-13.0	-1.3	-1.1	-0.9	-0.9	-0.7	-	-	
E3	-1.8	-1.3	-18.0	-13.0	-2.5	-2.2	-2.0	-2.0	-1.6	-	-	
E4	-1.8	-1.1	-14.0	-13.0	-11.0	-10.0	-9.0	-9.0	-7.0	-12.0	-10.5	
E5	-12.0	-10.0	-14.0	-13.0	-11.0	-11.0	-8.5	-8.5	-6.5	-10.5	-10.0	
E6	-0.9	-0.6	atm.	-2.0	-0.7	-0.5	-0.7	-0.5	-0.3	-	-	
E7	-1.6	-1.4	atm.	-2.2	-1.5	-0.9	-1.4	-1.1	-0.9	-	-	
E8	atm.	atm.	atm.	-0.5	-0.3	-0.2	-0.3	-0.2	-0.2	-	-	
HE	-1.0	-0.9	1.5	-1.4	-1.2	-0.9	-0.9	-0.1	-0.7	-1.0	-0.9	
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	> -0.1	0.0	0.0	> -0.1	
TD3	0.0	0.0	-1.0	-1.0	-0.7	-0.7	-0.6	-0.4	-0.5	-0.1	-0.7	
TD4	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	
TD5	-0.4	-0.3	-0.7	-0.7	-0.6	-0.5	-0.3	-0.3	-0.2	> -0.1	-0.3	
TD6	-2.0	-1.7	-2.9	-2.7	-2.1	-2.4	-1.8	-1.7	-1.3	> -0.1	-1.2	
TD7	0.0	-0.1	-0.1	-0.1	0.0	-0.6	-	-0.1	-0.1	-0.3	> -0.1	
TD8	-0.7	-0.6	-1.3	-1.1	-0.8	0.0	-	-0.6	-0.4	-0.8	-0.6	
Suction	-20.0	-21.0	-26.0	-27.0	-23.0	-21.0	-21.0	-19.0	-16.0	-21.0	-20.0	
Discharge	23.0	22.0	34.0	-33.0	28.0	23.0	21.0	22.0	19.0	24.0	24.0	
Compressor	692.0	636.7	1439.4	1218.0	885.8	747.4	636.7	609.0	498.3	650.5	650.5	
Flare	13.8	13.8	16.6	13.8	16.6	16.6	13.8	16.6	13.8	13.8	13.8	

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	53	50	60	52	50	55	50	50	45	50	50	
Flare	85	85	125	120	90	85	95	90	95	85	95	

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	117.5	119.2	122.9	122.4	130.4	133.2	138.6	135.8	139.2	139.2	142.7	
A2	171.1	136.2	127.3	181.9	180.7	168.1	159.2	142.5	136.2	123.3	116.1	

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	29.0	24.0	29.0	22.0	29.1	30.6	33.3	32.0	32.0	26.0	33.3	
E1	30.9	25.0	29.6	26.8	-	-	-	-	-	-	-	
E2	30.3	31.1	58.0	58.6	-	31.4	-	-	-	-	-	
E3	30.8	31.8	40.0	29.3	-	-	-	-	-	-	-	
E4	36.9	25.6	69.0	70.7	83.1	88.2	89.9	91.6	91.5	92.5	93.5	
E5	89.6	78.0	79.3	70.1	70.3	65.2	64.8	59.8	58.7	58.5	59.1	
E6	-	-	-	-	-	-	-	-	-	-	-	
E7	-	-	-	-	-	-	-	-	-	-	-	
E8	-	-	-	-	-	-	-	-	-	-	-	
HE	-	-	-	-	-	30.0	-	-	-	-	-	
E1,2,&3	34.0	28.7	35.0	30.3	-	-	-	-	-	-	-	
E4&5	72.8	64.8	67.3	58.8	62.7	64.6	63.4	63.2	62.5	64.8	65.9	
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	
Christmas Tree	57.8	56.7	56.7	44.4	57.2	56.7	58.9	57.8	58.3	58.3	61.1	
Mixed Vapor	45.0	43.3	43.3	37.2	45.0	46.1	46.7	46.1	46.1	42.8	46.1	

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extracti

Date	6/3/94	6/4/94	6/4/94	6/5/94	6/5/94	6/6/94	6/6/94	6/7/94	6/7/94	6/8/94	6/8/94	6/9/94
Time	16:20	08:52	20:58	9:05	17:55	9:10	18:10	9:22	16:54	10:08	17:58	9:19
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.6	-0.6		-0.6	-0.6	-0.5	-0.5	-0.5	-0.6	-0.5	-0.5	-0.5
E2	-1.7	-1.5		-1.6	-1.4	-1.5	-1.5	-1.3	-1.5	-1.7	-1.4	-1.4
E3	-1.6	-1.4		-1.4	-1.5	-1.4	-1.4	-1.4	-1.5	-1.3	-1.4	-1.4
E4	-7.0	-6.5		-6.0	-6.0	-7.5	-6.0	-6.0	-6.0	-7.0	-6.0	-5.5
E5	-8.0	-6.5		-7.0	-6.0	-6.0	-6.0	-6.0	-6.5	-5.5	-6.0	-5.5
E6	-1.1	-1.1		-1.0	-1.0	-1.0	-1.0	-1.0	-1.1	-1.0	-1.1	-1.0
E7	-1.0	-1.2		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
E8	-0.2	-0.2		-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3
HE	-0.6	-0.6		-0.7	-0.6	-0.5	-0.6	-0.5	-0.6	-0.5	-0.5	-0.5
TD1	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	>-0.1	>-0.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
TD3	-0.8	-1.0		-0.8	-0.9	-0.7	-1.0	-0.7	-0.5	-0.7	-0.6	-0.7
TD4	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.1	>-0.1		-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2
TD6	-0.9	-0.5		-0.6	-0.6	-0.6	-0.7	-0.6	-0.5	-0.4	-0.5	-0.7
TD7	-0.1	>-0.1		-0.1	-0.2	>-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1
TD8	-0.5	-0.7		-0.5	-0.6	-0.5	-0.5	-0.4	-0.5	-0.5	-0.5	>-0.1
Suction	-18.0	-20.0		-27.0	-17.0	-16.0	-17.0	-23.0	-17.0	-16.0	-16.0	-15.0
Discharge	22.0	26.0		21.0	21.0	20.0	21.0	27.0	21.0	20.0	-21.0	18.0
Compressor	3543.2	802.7		775.1	830.4	775.1	802.7	802.7	830.4	775.1	830.4	775.1
Flare	16.6	16.6		16.6	13.8	16.6	16.6	16.6	13.8	16.6	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	45	45		50	45	45	45	45	45	50	50	50
Flare	95	95		95	95	95	95	85	95	95	95	95

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	106.0	99.3		90.9	88.5	83.9	82.3	74.4	73.7	69.9	68.6	66.1
A2	116.6	115.9		123.5	130.3	135.5	135.4	117.2	113.7	107.0	110.9	103.6

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	33.0	25.0		26.0	35.0	30.0	35.0	31.0	37.0	32.0	37.0	29.0
E1	-	-		-	-	-	-	-	-	-	-	-
E2	-	-		-	-	-	-	-	-	-	-	-
E3	-	-		-	-	-	-	-	-	-	-	-
E4	57.7	55.0		52.5	54.1	51.2	51.7	49.4	50.5	50.0	50.2	48.0
E5	68.4	67.6		71.2	73.6	71.7	76.8	71.3	77.3	74.2	76.8	70.5
E6	-	-		-	-	-	-	-	-	-	-	-
E7	-	-		-	-	-	-	-	-	-	-	-
E8	-	-		-	-	-	-	-	-	-	-	-
HE	-	-		-	-	-	-	-	-	-	-	-
E1,2,&3	-	-		-	-	-	-	-	-	-	-	-
E4&5	61.3	65.1		67.7	68.1	66.7	66.9	64.9	67.2	66.7	66.6	66.2
E6,7, &8	-	-		-	-	-	-	-	-	-	-	-
Christmas Tree	62.8	62.8		69.4	65.6	65.6	62.8	62.8	63.9	62.8	62.8	62.8
Mixed Vapor	51.7	57.2		51.7	54.4	51.7	48.9	51.7	57.2	54.4	51.7	51.7

TABLE B.4.  
OPERATING CONDITIONS  
KAI DEMONSTRATION

Vapor Extracti

Date	6/15/94	6/15/94	6/16/94	6/16/94	6/17/94	6/17/94	6/18/94	6/18/94	6/19/94	6/19/94	6/20/94	6/20/94
Time	8:52	19:14	0:00	17:20	7:19	18:12	7:27	18:29	8:37	16:34	8:25	16:31
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-8.0	-12.0	-7.0	-11.0	-7.0	-9.0	-6.0	-11.0	-5.0	-7.0	-6.0	-7.0
E2	-8.0	-12.0	-7.0	-12.0	-7.0	-10.0	-6.0	-12.0	-5.0	-7.0	-6.0	-7.0
E3	-8.0	-12.0	-7.0	-12.0	-7.0	-10.0	-6.0	-12.0	-7.0	-7.0	-6.0	-7.0
E4	-1.4	-2.2	-1.3	-1.8	-1.2	-1.4	-1.1	-1.6	-0.8	-0.9	-1.0	-0.9
E5	-1.5	-2.2	-1.4	-1.8	-1.2	-1.4	-1.1	-1.6	-1.0	-0.8	-1.0	-0.9
E6	-1.0	-2.0	-1.5	-1.7	-1.2	-1.4	-1.0	-1.6	-1.0	-0.9	-0.9	-1.0
E7	-1.0	-1.5	-1.3	-1.2	-0.8	-1.0	-0.7	-1.0	-0.7	-0.6	-0.7	-0.6
E8	-1.0	-2.6	0.0	-2.0	-1.4	-1.5	-1.3	-1.8	-1.3	-0.9	-1.0	-1.0
HE	-0.3	-0.5	0.0	-0.5	-0.3	-0.3	-0.2	0.4	-0.2	-0.2	-0.2	-0.2
TD1	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	-1.5	-1.7	-1.0	-1.3	-0.8	-1.0	-0.8	-1.2	-0.8	-0.7	-0.3	-0.6
TD4	0.0	0.0	>-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.4	-0.5	-0.5	-0.4	-0.3	-0.3	-0.2	-0.3	-0.2	-0.4	0.0	0.1
TD6	-1.9	-1.6	-1.3	-1.5	-1.1	-1.0	-0.9	-1.3	-0.9	-0.6	-0.1	-0.5
TD7	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2
TD8	-0.7	-0.8	-0.6	-0.6	-0.4	-0.5	-0.3	-0.6	-0.4	-0.3	-0.3	-0.2
Suction	-17.0	-17.0	-16.0	-16.0	-15.0	-14.0	-13.0	-17.0	-9.0	-9.0	-12.0	-10.0
Discharge	21.0	23.0	24.0	21.0	19.0	18.0	17.0	22.0	12.0	13.0	16.0	13.0
Compressor	747.4	747.4	609.0	581.3	581.3	581.3	747.4	498.3	304.5	387.5	387.5	387.5
Flare	13.8	13.8	13.8	13.8	11.1	11.1	8.3	8.3	11.1	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	50	50	50	45	50	50	50	50	40	40	40	60
Flare	85	100	80	85	75	80	75	85	70	70	70	65

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	53.8	52.2	51.4	51.3	50.2	49.6	49.0	48.8	48.0	47.6	46.9	46.7
A2	101.5	99.9	96.1	93.7	89.8	87.6	84.6	83.3	80.6	79.5	77.1	76.6

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	26.0	25.6	25.0	32.0	24.0	35.0	25.0	35.0	27.0	26.0	27.0	34.0
E1	30.2	31.4	29.7	34.8	30.5	36.6	31.6	36.4	33.1	34.2	31.1	36.4
E2	39.7	39.8	39.3	42.7	38.4	42.4	38.7	41.8	38.7	39.9	37.8	41.4
E3	40.8	41.5	39.8	42.4	39.1	42.5	39.2	42.8	39.3	38.2	38.1	41.0
E4	33.5	36.0	33.8	43.6	36.1	43.2	31.8	46.1	34.5	36.0	29.6	-
E5	37.5	40.1	33.6	40.0	35.6	42.0	34.2	42.0	35.7	38.3	32.5	-
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	32.1	33.2	31.8	36.7	32.1	38.8	32.7	38.6	33.3	31.6	32.3	38.1
E4&5	-	-	-	-	-	-	-	-	-	-	-	-
E6,7,&8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	31.1	25.6	30.0	36.1	30.0	38.3	30.0	38.3	30.6	29.4	30.6	34.4
Mixed Vapor	26.7	26.1	25.6	38.3	25.6	41.7	26.7	41.1	29.4	26.7	29.4	40.6

9  
AI  
KRF-A1-U0002  
0 - 2

9  
AI  
KRF-A1-U1618  
16 - 18

9  
AI  
KRF-A1-U1820  
18 - 20

PARAMETER

W8240 - Volatile Organics, cont. (ug/kg)

6.23 B	(2.7)	[1]	NA	NA	ND	(4960)	[1000]
Methylene Chloride	ND	[1]	NA	NA	ND	(2110)	[1000]
Styrene	(1.67)	[1]	NA	NA	ND	(3180)	[1000]
Tetrachloroethene	(4.91)	[1]	NA	NA	ND	(1850)	[1000]
Toluene	(1.76)	[1]	NA	NA	3400	(2520)	[1000]
Tribromomethane(Bromoform)	(1.56)	[1]	NA	NA	ND	(2390)	[1000]
Trichloroethene	(5.02)	[1]	NA	NA	ND	(3620)	[1000]
Vinyl Chloride	(2.14)	[1]	NA	NA	ND	(1460)	[1000]
Vinyl acetate	(11.3)	[1]	NA	NA	ND	(5750)	[1000]
Xylene (total)	(3.76)	[1]	NA	NA	< DL	(2180)	[1000]
cis-1,3-Dichloropropene	(1.66)	[1]	NA	NA	ND	(2100)	[1000]
trans-1,2-Dichloroethene	(2.41)	[1]	NA	NA	ND	(2340)	[1000]
trans-1,3-Dichloropropene	(1.8)	[1]	NA	NA	ND		

W8270 - Semivolatile Organics (ug/g)

1,2,4-Trichlorobenzene	ND	(0.0181)	[1]	NA	ND	(0.539)	[1]
1,2-Dichlorobenzene	ND	(0.0253)	[1]	NA	8.87	(0.753)	[1]
1,3-Dichlorobenzene	ND	(0.023)	[1]	NA	1.73	(0.685)	[1]
1,4-Dichlorobenzene	ND	(0.0301)	[1]	NA	6.79	(0.897)	[1]
2,4,5-Trichlorophenol	ND	(0.0226)	[1]	NA	ND	(0.674)	[1]
2,4,6-Trichlorophenol	ND	(0.027)	[1]	NA	ND	(0.803)	[1]
2,4-Dichlorophenol	ND	(0.0358)	[1]	NA	ND	(1.07)	[1]
2,4-Dimethylphenol	ND	(0.0332)	[1]	NA	ND	(0.989)	[1]
2,4-Dinitrophenol	ND	(0.0461)	[1]	NA	ND	(1.37)	[1]
2,4-Dinitrotoluene	ND	(0.0281)	[1]	NA	ND	(0.838)	[1]
2,6-Dinitrotoluene	ND	(0.0307)	[1]	NA	ND	(0.914)	[1]
2-Chloronaphthalene	ND	(0.027)	[1]	NA	ND	(0.805)	[1]
2-Chlorophenol	ND	(0.0233)	[1]	NA	ND	(0.694)	[1]
2-Methylnaphthalene	ND	(0.0239)	[1]	NA	20.7	(0.712)	[1]
2-Methylphenol	ND	(0.0129)	[1]	NA	ND	(0.385)	[1]
2-Nitroaniline	ND	(0.0304)	[1]	NA	ND	(0.905)	[1]
2-Nitrophenol	ND	(0.0305)	[1]	NA	ND	(0.909)	[1]
3,3'-Dichlorobenzidine	ND	(0.0368)	[1]	NA	ND	(1.1)	[1]
3-Nitroaniline	ND	(0.032)	[1]	NA	ND	(0.955)	[1]
4,6-Dinitro-2-methylphenol	ND	(0.0404)	[1]	NA	ND	(1.2)	[1]
4-Bromophenyl phenyl ether	ND	(0.0172)	[1]	NA	ND	(0.514)	[1]
4-Chloro-3-methylphenol	ND	(0.0165)	[1]	NA	ND	(0.491)	[1]

Compiled: 22 June 1994

( ) = Detection Limit    □ = Dilution Factor    ND = Not Detected    NA = Not Applicable    \* - Value considered suspect, Refer to DR Report





PARAMETER	9 A1		9 A2		9 A2		9 A2	
	KRF-A1-U2728 27 - 28		KRF-A2-U0002 0 - 2		KRF-A2-U0204 2 - 4		KRF-A2-U0406 4 - 6	
2240 - Volatile Organics, cont. (ug/kg)								
trans-1,2-Dichloroethene	ND	(178)	ND	(2.42)	[1]	ND	ND	(2.41)
trans-1,3-Dichloropropene	ND	(199)	ND	(1.8)	[1]	ND	ND	(1.8)
2270 - Semivolatile Organics (ug/g)								
2,4-Trichlorobenzene	ND	(0.433)	ND	(0.018)	[1]	ND	ND	(0.018)
2-Dichlorobenzene	ND	(0.605)	ND	(0.0252)	[1]	ND	ND	(0.0252)
3-Dichlorobenzene	ND	(0.551)	ND	(0.0229)	[1]	ND	ND	(0.0229)
4-Dichlorobenzene	ND	(0.721)	ND	(0.03)	[1]	ND	ND	(0.03)
4,5-Trichlorophenol	ND	(0.542)	ND	(0.0226)	[1]	ND	ND	(0.0225)
4,6-Trichlorophenol	ND	(0.645)	ND	(0.0269)	[1]	ND	ND	(0.0269)
4-Dichlorophenol	ND	(0.857)	ND	(0.0357)	[1]	ND	ND	(0.0357)
4-Dimethylphenol	ND	(0.795)	ND	(0.0331)	[1]	ND	ND	(0.0331)
4-Dinitrophenol	ND	(1.1)	ND	(0.0459)	[1]	ND	ND	(0.0459)
4-Dinitrotoluene	ND	(0.674)	ND	(0.028)	[1]	ND	ND	(0.028)
6-Dinitrotoluene	ND	(0.734)	ND	(0.0306)	[1]	ND	ND	(0.0306)
Chloronaphthalene	ND	(0.647)	ND	(0.0269)	[1]	ND	ND	(0.0269)
Chlorophenol	ND	(0.557)	ND	(0.0232)	[1]	ND	ND	(0.0232)
Methylnaphthalene	1.19	(0.572)	0.0316	(0.0238)	[1]	ND	ND	(0.0238)
Methylphenol	ND	(0.309)	ND	(0.0129)	[1]	ND	ND	(0.0129)
Nitroaniline	ND	(0.727)	ND	(0.0303)	[1]	ND	ND	(0.0303)
Nitrophenol	ND	(0.73)	ND	(0.0304)	[1]	ND	ND	(0.0304)
3'-Dichlorobenzidine	ND	(0.882)	ND	(0.0367)	[1]	ND	ND	(0.0367)
Nitroaniline	ND	(0.767)	ND	(0.0319)	[1]	ND	ND	(0.0319)
6-Dinitro-2-methylphenol	ND	(0.968)	ND	(0.0403)	[1]	ND	ND	(0.0403)
Bromophenyl phenyl ether	ND	(0.413)	ND	(0.0172)	[1]	ND	ND	(0.0172)
Chloro-3-methylphenol	ND	(0.394)	ND	(0.0164)	[1]	ND	ND	(0.0164)
Chlorophenyl phenyl ether	ND	(0.461)	ND	(0.0152)	[1]	ND	ND	(0.0192)
Methylphenol/3-Methylphenol	ND	(0.359)	ND	(0.015)	[1]	ND	ND	(0.015)
Nitroaniline	ND	(1.07)	ND	(0.0447)	[1]	ND	ND	(0.0447)
Nitrophenol	ND	(1.14)	ND	(0.0475)	[1]	ND	ND	(0.0475)
Benaphthene	ND	(0.63)	0.0475	(0.0262)	[1]	0.0502	ND	(0.0262)
Benaphthylene	ND	(0.624)	ND	(0.026)	[1]	ND	ND	(0.026)
Anthracene	ND	(0.752)	0.0711	(0.0313)	[1]	0.163	< DL	(0.0213)
benzo(a)anthracene	ND	(0.586)	0.378	(0.0244)	[1]	0.625	0.173	(0.0244)
benzo(a)pyrene	ND	(0.783)	0.459	(0.0326)	[1]	0.589	0.182	(0.0326)
benzo(b)fluoranthene	ND	(1.03)	1.03 F	(0.0431)	[1]	1.12 F	0.422 F	(0.0431)

( ) = Detection Limit  
 [ ] = Dilution Factor  
 ND = Not Detected  
 NA = Not Applicable  
 \* - Value considered suspect, Refer to report

Filed: 22 Jun 1994

PARAMETER	9 A2		9 A2		9 A2		9 A2					
	KRF-A2-U1012		KRF-A2-U1012D		KRF-A2-U1214		KRF-A2-U1618					
	10 - 12	10 - 12	10 - 12	10 - 12	12 - 14	16 - 18						
Hydrocarbons	1290	(32.1)	[1]	571	(33.4)	[1]	622	(34.6)	[1]	23000	(622)	[20]
240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	NA			NA			NA			ND	(391)	[200]
1,1,2,2-Tetrachloroethane	NA			NA			NA			ND	(799)	[200]
1,1,2-Trichloroethane	NA			NA			NA			ND	(478)	[200]
1-Dichloroethane	NA			NA			NA			ND	(458)	[200]
1-Dichloroethene	NA			NA			NA			ND	(646)	[200]
2-Dichloroethane	NA			NA			NA			ND	(681)	[200]
2-Dichloropropane	NA			NA			NA			ND	(426)	[200]
Chloroethyl vinyl ether	NA			NA			NA			ND	(247)	[200]
Hexanone	NA			NA			NA			ND	(765)	[200]
Methyl-2-Pentanone(MIBK)	NA			NA			NA			ND	(661)	[200]
Methyl ketone	NA			NA			NA			ND	(1030)	[200]
Benzene	NA			NA			NA			< DL	(891)	[200]
Monochloromethane	NA			NA			NA			ND	(567)	[200]
Dimethylmethane	NA			NA			NA			ND	(908)	[200]
Carbon disulfide	NA			NA			NA			ND	(836)	[200]
Carbon tetrachloride	NA			NA			NA			ND	(676)	[200]
Torobenzene	NA			NA			NA			29400	(539)	[200]
Toroethane	NA			NA			NA			ND	(812)	[200]
Toroform	NA			NA			NA			ND	(359)	[200]
Toromethane	NA			NA			NA			ND	(690)	[200]
Bromochloromethane	NA			NA			NA			ND	(403)	[200]
Nyl benzene	NA			NA			NA			1120	(591)	[200]
Thyl ethyl ketone	NA			NA			NA			ND	(1000)	[200]
Thylene Chloride	NA			NA			NA			ND	(995)	[200]
Pyrene	NA			NA			NA			ND	(423)	[200]
Trachloroethene	NA			NA			NA			ND	(638)	[200]
Toluene	NA			NA			NA			1120	(371)	[200]
Bromomethane(Bromoform)	NA			NA			NA			ND	(505)	[200]
Chloroethene	NA			NA			NA			ND	(480)	[200]
Nyl Chloride	NA			NA			NA			ND	(725)	[200]
Nyl acetate	NA			NA			NA			ND	(292)	[200]
Bene (total)	NA			NA			NA			6520	(1150)	[200]
Is-1,3-Dichloropropene	NA			NA			NA			ND	(438)	[200]

9  
A2  
KRF-A2-U1012  
10 - 12

9  
A2  
KRF-A2-U1012D  
10 - 12

9  
A2  
KRF-A2-U1214  
12 - 14

9  
A2  
KRF-A2-U1618  
16 - 18

PARAMETER

8270 - Semivolatile Organics, cont. (ug/g)

benzo(g,h,i)perylene	NA	NA	NA	MD X	(0.142)	(1)
benzo(k)fluoranthene	NA	NA	NA	0.172 XF	(0.138)	(1)
benzoic acid	NA	NA	NA	MD	(3.28)	(1)
benzyl alcohol	NA	NA	NA	MD	(0.0677)	(1)
butylbenzylphthalate	NA	NA	NA	MD	(0.229)	(1)
chrysene	NA	NA	NA	0.196	(0.125)	(1)
1-n-octylphthalate	NA	NA	NA	MD X	(0.0648)	(1)
benz(a,h)anthracene	NA	NA	NA	MD X	(0.126)	(1)
benzofuran	NA	NA	NA	MD	(0.0696)	(1)
butylphthalate	NA	NA	NA	0.147	(0.0622)	(1)
ethylphthalate	NA	NA	NA	MD	(0.0319)	(1)
methylphthalate	NA	NA	NA	MD	(0.0563)	(1)
phenylamine	NA	NA	NA	MD	(0.113)	(1)
fluoranthene	NA	NA	NA	0.562	(0.0741)	(1)
fluorene	NA	NA	NA	0.354	(0.0577)	(1)
hexachlorobenzene	NA	NA	NA	MD	(0.0693)	(1)
hexachlorobutadiene	NA	NA	NA	MD	(0.13)	(1)
hexachlorocyclopentadiene	NA	NA	NA	MD	(0.15)	(1)
hexachloroethane	NA	NA	NA	MD	(0.0694)	(1)
indeno(1,2,3-cd)pyrene	NA	NA	NA	MD X	(0.111)	(1)
isophorone	NA	NA	NA	MD	(0.0406)	(1)
Nitroso-di-n-propylamine	NA	NA	NA	MD	(0.0775)	(1)
phthalene	NA	NA	NA	1.37	(0.0971)	(1)
trobenzene	NA	NA	NA	MD	(0.0552)	(1)
pentachlorophenol	NA	NA	NA	MD	(0.12)	(1)
menanthrene	NA	NA	NA	0.907	(0.083)	(1)
phenol	NA	NA	NA	MD	(0.0468)	(1)
pyrene	NA	NA	NA	0.406	(0.089)	(1)
s(2-Chloroethoxy)methane	NA	NA	NA	MD	(0.0795)	(1)
s(2-Chloroethyl)ether	NA	NA	NA	MD	(0.0613)	(1)
s(2-Chloroisopropyl)ether	NA	NA	NA	MD	(0.0557)	(1)
s(2-Ethylhexyl)phthalate	NA	NA	NA	27.1	(0.668)	(2)
Chloroaniline	NA	NA	NA	MD	(0.118)	(1)

846 - Percent Moisture (percent)

Percent moisture	22.3	(0)	(1)	25.3	(0)	(1)	28	(0)	(1)	19.9	(0)	(1)
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Compiled: 22 June 1994

( ) = Detection Limit [ ] = Dilution Factor MD = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to Report

9  
E1  
KRF-E1-U0002  
0 - 2

9  
A2  
KRF-A2-U2628  
26 - 28

9  
A2  
KRF-A2-U2022  
20 - 22

9  
A2  
KRF-A2-U16180  
16 - 18

ANALYTER

140 - Volatile Organics, cont. (ug/kg)

ND (106) [50] ND (2200) [1000] NA  
ND (119) [50] ND (2460) [1000] NA

170 - Semivolatile Organics (ug/g)

1,4-Dichlorobenzene	ND	(0.053)	[1]	24.5	(5.48)	[10]	NA
1,2-Dichlorobenzene	0.0827	(0.072)	[1]	989	(7.66)	[10]	NA
1,3-Dichlorobenzene	0.228	(0.0702)	[1]	58.8	(0.697)	[1]	NA
1,4-Dichlorobenzene	1.14	(0.0919)	[1]	118	(0.912)	[1]	NA
1,5-Trichlorophenol	ND	(0.0691)	[1]	ND	(0.686)	[1]	NA
1,6-Trichlorophenol	ND	(0.0823)	[1]	ND	(0.817)	[1]	NA
1,7-Dichlorophenol	ND	(0.109)	[1]	ND	(1.08)	[1]	NA
1,8-Dimethylphenol	ND	(0.101)	[1]	46.7	(1.01)	[1]	NA
1,9-Dinitrophenol	ND	(0.141)	[1]	ND	(1.4)	[1]	NA
1,10-Dinitrotoluene	ND	(0.0859)	[1]	ND	(0.852)	[1]	NA
1,11-Dinitrotoluene	ND	(0.0936)	[1]	ND	(0.929)	[1]	NA
1,12-Chloronaphthalene	ND	(0.0826)	[1]	ND	(0.819)	[1]	NA
1,13-Chlorophenol	ND	(0.0711)	[1]	ND	(0.705)	[1]	NA
1,14-Methylnaphthalene	1.02	(0.073)	[1]	31.4	(0.724)	[1]	NA
1,15-Methylphenol	ND	(0.0395)	[1]	7.4	(0.392)	[1]	NA
1,16-Nitroaniline	ND	(0.0928)	[1]	ND	(0.92)	[1]	NA
1,17-Nitrophenol	ND	(0.0932)	[1]	ND	(0.924)	[1]	NA
1,18'-Dichlorobenzidine	ND	(0.112)	[1]	ND	(1.12)	[1]	NA
1,19-Nitroaniline	ND	(0.0979)	[1]	ND	(0.971)	[1]	NA
1,20-Dinitro-2-methylphenol	ND	(0.123)	[1]	ND	(1.22)	[1]	NA
1,21-Bromophenyl phenyl ether	ND	(0.0527)	[1]	ND	(0.523)	[1]	NA
1,22-Chloro-3-methylphenol	ND	(0.0503)	[1]	ND	(0.499)	[1]	NA
1,23-Chlorophenyl phenyl ether	ND	(0.0588)	[1]	ND	(0.583)	[1]	NA
1,24-Methylphenol/3-Methylphenol	ND	(0.0458)	[1]	23.2 F	(0.455)	[1]	NA
1,25-Nitroaniline	ND	(0.137)	[1]	ND	(1.36)	[1]	NA
1,26-Nitrophenol	ND	(0.146)	[1]	ND	(1.45)	[1]	NA
1,27-Naphthene	ND	(0.0803)	[1]	ND	(0.797)	[1]	NA
1,28-Naphthylene	< DL	(0.0796)	[1]	ND	(0.789)	[1]	NA
1,29-Chracene	ND	(0.0959)	[1]	ND	(0.951)	[1]	NA
1,30-azo(a)anthracene	0.0907	(0.0747)	[1]	ND	(0.741)	[1]	NA
1,31-azo(a)pyrene	< DL	(0.0999)	[1]	ND	(0.991)	[1]	NA
1,32-azo(b)fluoranthene	0.199 F	(0.132)	[1]	ND	(1.31)	[1]	NA

11/11/22 Jir 1994

( ) = Detection Limit [ ] = Dilution Factor ND = Not Detected HA = Not Applicable \* - Value considered suspect, Refer to NR Report

9  
EI  
KRF-EI-U1012  
10 - 12

9  
EI  
KRF-EI-U1618  
16 - 18

9  
EI  
KRF-EI-U1618D  
16 - 18

9  
EI  
KRF-EI-U2425  
24 - 25

PARAMETER

3350  
Total Recoverable Petroleum Hydrocarbons (mg/kg)  
(285)

22,000 SD  
21300

[10]

(536)

[20]

(536)

[20]

(132)

[5]

240 - Volatile Organics (ug/kg)

1,1,1-Trichloroethane	NA	ND	(532)	[500]	ND	(530)	[500]	ND	(1050)	[1000]
1,1,2,2-Tetrachloroethane	NA	ND	(692)	[500]	ND	(690)	[500]	ND	(1370)	[1000]
1,1,2-Trichloroethane	NA	ND	(525)	[500]	ND	(524)	[500]	ND	(1040)	[1000]
1-Dichloroethane	NA	ND	(417)	[500]	ND	(416)	[500]	ND	(825)	[1000]
1-Dichloroethene	NA	ND	(1030)	[500]	ND	(1030)	[500]	ND	(2040)	[1000]
2-Dichloroethane	NA	ND	(762)	[500]	ND	(760)	[500]	ND	(1510)	[1000]
2-Dichloropropane	NA	ND	(1440)	[500]	ND	(1430)	[500]	ND	(2850)	[1000]
Chloroethyl vinyl ether	NA	ND	(762)	[500]	ND	(760)	[500]	ND	(1510)	[1000]
Hexanone	NA	ND	(842)	[500]	ND	(840)	[500]	ND	(1670)	[1000]
Methyl-2-Pentanone(MIBK)	NA	ND	(569)	[500]	ND	(567)	[500]	ND	(1130)	[1000]
Petone	NA	< DL	(3150)	[500]	< DL	(3140)	[500]	< DL	(6230)	[1000]
Benzene	NA	923	(352)	[500]	1590	(352)	[500]	< DL	(698)	[1000]
Monochloromethane	NA	ND	(1930)	[500]	ND	(1920)	[500]	ND	(3810)	[1000]
Bromomethane	NA	ND	(992)	[500]	ND	(990)	[500]	ND	(1960)	[1000]
Carbon disulfide	NA	ND	(789)	[500]	ND	(787)	[500]	ND	(1560)	[1000]
Carbon tetrachloride	NA	ND	(778)	[500]	ND	(776)	[500]	ND	(1540)	[1000]
Torobenzene	NA	55500	(542)	[500]	70500	(541)	[500]	ND	(1070)	[1000]
Toroethane	NA	ND	(724)	[500]	ND	(722)	[500]	ND	(1430)	[1000]
Toroform	NA	ND	(323)	[500]	ND	(322)	[500]	ND	(639)	[1000]
Toromethane	NA	ND	(524)	[500]	< DL	(522)	[500]	ND	(1040)	[1000]
Bromochloromethane	NA	ND	(380)	[500]	ND	(379)	[500]	ND	(753)	[1000]
Phyl benzene	NA	ND	(590)	[500]	ND	(589)	[500]	< DL	(1170)	[1000]
Phyl ethyl ketone	NA	1720 B	(1480)	[500]	1720 B	(1480)	[500]	3550 B	(2930)	[1000]
Phylene Chloride	NA	3440	(992)	[500]	1170	(990)	[500]	2430	(1960)	[1000]
Brene	NA	ND	(579)	[500]	ND	(578)	[500]	ND	(1150)	[1000]
Trachloroethene	NA	ND	(783)	[500]	ND	(781)	[500]	ND	(1550)	[1000]
Buen	NA	ND	(432)	[500]	ND	(431)	[500]	4690	(855)	[1000]
Bromomethane(Bromoform)	NA	ND	(263)	[500]	ND	(259)	[500]	ND	(514)	[1000]
Chloroethene	NA	ND	(837)	[500]	ND	(835)	[500]	ND	(1660)	[1000]
Phyl Chloride	NA	ND	(660)	[500]	ND	(658)	[500]	ND	(1310)	[1000]
Phyl acetate	NA	ND	(440)	[500]	ND	(439)	[500]	ND	(871)	[1000]
ene (total)	NA	ND	(1360)	[500]	ND	(1360)	[500]	7260	(2700)	[1000]
1,3-Dichloropropene	NA	ND	(291)	[500]	ND	(290)	[500]	ND	(576)	[1000]

22 June 1994

( ) = Detection Limit

□ = Dilution Factor

ND = Not Detected

NA = Not Applicable

\* - Value considered suspect, Refer to Report

9  
E1  
KRF-E1-U1012  
10 - 12

9  
E1  
KRF-E1-U1618  
16 - 18

9  
E1  
KRF-E1-U16180  
16 - 18

9  
E1  
KRF-E1-U2425  
24 - 25

AMETER

10 - Semivolatile Organics, cont. (ug/g)

NA	ND	(0.12)	[1]	ND X	(0.122)	[1]	ND	(1.12)	[1]
co(g,h,i)perylene	0.216 F	(0.117)	[1]	0.305 XF	(0.119)	[1]	ND	(1.09)	[1]
co(k)fluoranthene	ND	(2.76)	[1]	ND	(2.81)	[1]	ND	(25.9)	[1]
coic acid	ND	(0.057)	[1]	ND	(0.0581)	[1]	ND	(0.535)	[1]
yl alcohol	ND	(0.193)	[1]	< DL	(0.197)	[1]	ND	(1.81)	[1]
lbenzylphthalate	0.203	(0.105)	[1]	0.233	(0.107)	[1]	ND	(0.985)	[1]
rsene	ND	(0.0546)	[1]	ND Y	(0.0556)	[1]	ND	(0.512)	[1]
-octylphthalate	ND	(0.106)	[1]	ND X	(0.108)	[1]	ND	(0.995)	[1]
nz(a,h)anthracene	ND	(0.0587)	[1]	ND X	(0.0598)	[1]	ND	(0.551)	[1]
nzofuran	0.612	(0.0524)	[1]	0.677	(0.0534)	[1]	ND	(0.492)	[1]
tylphthalate	ND X	(0.0269)	[1]	ND X	(0.0274)	[1]	ND	(0.252)	[1]
hylphthalate	ND X	(0.0475)	[1]	ND X	(0.0483)	[1]	ND	(0.445)	[1]
thylphthalate	ND	(0.0953)	[1]	ND	(0.0971)	[1]	ND	(0.894)	[1]
enylamine	3.1	(0.0625)	[1]	3.84	(0.0636)	[1]	0.664	(0.586)	[1]
ranthene	ND X	(0.0486)	[1]	ND X	(0.0495)	[1]	ND	(0.456)	[1]
rene	0.171	(0.0584)	[1]	ND	(0.0595)	[1]	ND	(0.548)	[1]
chlorobenzene	ND	(0.109)	[1]	ND	(0.111)	[1]	ND	(1.02)	[1]
chlorobutadiene	ND X	(0.126)	[1]	ND X	(0.128)	[1]	ND	(1.18)	[1]
chlorocyclopentadiene	ND	(0.0585)	[1]	ND	(0.0596)	[1]	ND	(0.549)	[1]
chloroethane	ND	(0.0935)	[1]	ND X	(0.0953)	[1]	ND	(0.878)	[1]
no(1,2,3-cd)pyrene	ND	(0.0342)	[1]	ND	(0.0349)	[1]	ND	(0.321)	[1]
horone	ND	(0.0653)	[1]	ND	(0.0665)	[1]	ND	(0.613)	[1]
troso-di-n-propylamine	ND	(0.0818)	[1]	ND	(0.0833)	[1]	2.97	(0.767)	[1]
lthalene	ND	(0.0465)	[1]	ND	(0.0474)	[1]	ND	(0.436)	[1]
obenzene	ND	(0.101)	[1]	ND	(0.103)	[1]	ND	(0.947)	[1]
achlorophenol	1.46	(0.0699)	[1]	1.63	(0.0712)	[1]	ND	(0.656)	[1]
anthrene	ND	(0.0395)	[1]	ND	(0.0402)	[1]	ND	(0.37)	[1]
ol	0.736	(0.075)	[1]	0.785	(0.0763)	[1]	ND	(0.703)	[1]
ne	ND	(0.067)	[1]	ND	(0.0682)	[1]	ND	(0.629)	[1]
2-Chloroethoxy)methane	ND	(0.0517)	[1]	ND	(0.0526)	[1]	ND	(0.485)	[1]
2-Chloroethyl)ether	ND	(0.0469)	[1]	ND	(0.0478)	[1]	ND	(0.44)	[1]
2-Chloroisopropyl)ether	25.9	(1.41)	[5]	26.1	(1.43)	[5]	3.61	(2.64)	[1]
2-Ethylhexyl)phthalate	ND	(0.0995)	[1]	ND	(0.101)	[1]	ND	(0.934)	[1]
loroaniline									

- Percent Moisture (percent)  
ent moisture

12.5	(0)	[1]	6.89	(0)	[1]	7.13	(0)	[1]	6.01	(0)	[1]
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led: 22 June 1994

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PARAMETER	9 E3		9 E3		9 E4							
	KRF-E3-U1618 16 - 18	KRF-E3-U2022 20 - 22	KRF-E3-U2829 28 - 29	KRF-E4-U0709 7 - 9								
18.1 - Total Recoverable Petroleum Hydrocarbons	7410	(157)	[5]	1360	(33.3)	[1]	325	(26.5)	[1]	1310	(29.7)	[1]
8240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	ND	(125)	[100]	ND	(13100)	[10000]	NA			NA		NA
1,1,2,2-Tetrachloroethane	ND	(163)	[100]	ND	(17100)	[10000]	NA			NA		NA
1,1,2-Trichloroethane	ND	(123)	[100]	ND	(13000)	[10000]	NA			NA		NA
1,1-Dichloroethane	ND	(98)	[100]	ND	(10300)	[10000]	NA			NA		NA
1,1-Dichloroethene	ND	(242)	[100]	ND	(25500)	[10000]	NA			NA		NA
2,2-Dichloroethane	ND	(179)	[100]	ND	(18800)	[10000]	NA			NA		NA
2,2-Dichloropropane	ND	(338)	[100]	ND	(35500)	[10000]	NA			NA		NA
Chloroethyl vinyl ether	ND	(179)	[100]	ND	(18800)	[10000]	NA			NA		NA
Hexanone	ND	(198)	[100]	ND	(20800)	[10000]	NA			NA		NA
Methyl-2-Pentanone(MIBK)	ND	(134)	[100]	ND	(14100)	[10000]	NA			NA		NA
Petone	< DL	(740)	[100]	ND	(77900)	[10000]	NA			NA		NA
Benzene	ND	(82.8)	[100]	ND	(8710)	[10000]	NA			NA		NA
Monodichloromethane	ND	(453)	[100]	ND	(47600)	[10000]	NA			NA		NA
Monomethane	ND	(233)	[100]	ND	(24500)	[10000]	NA			NA		NA
Carbon disulfide	ND	(185)	[100]	ND	(19500)	[10000]	NA			NA		NA
Carbon tetrachloride	ND	(183)	[100]	ND	(19200)	[10000]	NA			NA		NA
Chlorobenzene	8440	(127)	[100]	< DL	(13400)	[10000]	NA			NA		NA
Chloroethane	ND	(170)	[100]	ND	(17900)	[10000]	NA			NA		NA
Chloroform	ND	(75.9)	[100]	ND	(7980)	[10000]	NA			NA		NA
Chloromethane	ND	(123)	[100]	< DL	(12900)	[10000]	NA			NA		NA
Bromochloromethane	ND	(89.4)	[100]	ND	(9400)	[10000]	NA			NA		NA
Ethyl benzene	< DL	(139)	[100]	< DL	(14600)	[10000]	NA			NA		NA
Ethyl ethyl ketone	467 8	(348)	[100]	ND	(36600)	[10000]	NA			NA		NA
Ethylene Chloride	339	(233)	[100]	35100	(24509)	[10000]	NA			NA		NA
Ethylene	ND	(136)	[100]	ND	(14300)	[10000]	NA			NA		NA
Tetrachloroethene	ND	(184)	[100]	ND	(19400)	[10000]	NA			NA		NA
Blue	ND	(102)	[100]	80600	(10700)	[10000]	NA			NA		NA
Bromomethane(Bromoform)	ND	(61)	[100]	ND	(6420)	[10000]	NA			NA		NA
Trichloroethene	ND	(197)	[100]	ND	(20700)	[10000]	NA			NA		NA
Nyl Chloride	ND	(155)	[100]	ND	(16300)	[10000]	NA			NA		NA
Nyl acetate	ND	(103)	[100]	ND	(10900)	[10000]	NA			NA		NA
Ethylene (total)	ND	(320)	[100]	89900	(33700)	[10000]	NA			NA		NA
s-1,3-Dichloropropene	ND	(68.3)	[100]	ND	(7190)	[10000]	NA			NA		NA

Compiled: 22 Jir 1994

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9

E3

KRF-E3-U1618

16 - 18

9

E3

KRF-E3-U2022

20 - 22

9

E3

KRF-E3-U2829

28 - 29

9

E4

KRF-E4-U0709

7 - 9

## PARAMETER

## 270 - Semivolatile Organics, cont. (ug/g)

nzo(g,h,i)perylene	ND	(0.083)	[1]	< DL	(0.82)	[1]	NA	NA
nzo(k)fluoranthene	< DL	(0.108)	[1]	< DL	(1.07)	[1]	NA	NA
nzoic acid	ND	(0.74)	[1]	ND	(7.3)	[1]	NA	NA
nzy alcohol	ND	(0.0746)	[1]	ND	(0.736)	[1]	NA	NA
tylbenzylphthalate	ND	(0.117)	[1]	< DL	(2.14)	[1]	NA	NA
rysene	< DL	(0.094)	[1]	< DL	(0.882)	[1]	NA	NA
n-octylphthalate	ND	(0.0979)	[1]	ND	(0.966)	[1]	NA	NA
benz(a,h)anthracene	ND	(0.0898)	[1]	ND	(0.886)	[1]	NA	NA
benzofuran	ND	(0.0682)	[1]	ND	(0.673)	[1]	NA	NA
butylphthalate	ND	(0.0714)	[1]	2.86	(0.705)	[1]	NA	NA
ethylphthalate	ND	(0.0467)	[1]	ND	(0.461)	[1]	NA	NA
methylphthalate	ND	(0.0488)	[1]	ND	(0.482)	[1]	NA	NA
phenylamine	ND	(0.114)	[1]	ND	(1.12)	[1]	NA	NA
fluoranthene	0.278	(0.0769)	[1]	26.2	(0.759)	[1]	NA	NA
fluorene	0.128	(0.0638)	[1]	3.27	(0.629)	[1]	NA	NA
acachlorobenzene	ND	(0.0865)	[1]	2.76	(0.853)	[1]	NA	NA
acachlorobutadiene	ND	(0.0904)	[1]	ND	(0.892)	[1]	NA	NA
acachlorocyclopentadiene	ND	(0.261)	[1]	ND	(2.58)	[1]	NA	NA
acachloroethane	ND	(0.103)	[1]	ND	(1.02)	[1]	NA	NA
acachloroethane	ND	(0.0651)	[1]	< DL	(0.643)	[1]	NA	NA
acachloroethane	ND	(0.0938)	[1]	ND	(0.926)	[1]	NA	NA
acachloroethane	ND	(0.0529)	[1]	ND	(0.522)	[1]	NA	NA
acachloroethane	ND	(0.0778)	[1]	53.3	(0.767)	[1]	NA	NA
acachloroethane	ND	(0.14)	[1]	ND	(1.38)	[1]	NA	NA
acachloroethane	ND	(0.13)	[1]	ND	(1.28)	[1]	NA	NA
acachloroethane	0.336	(0.0999)	[1]	4.79	(0.985)	[1]	NA	NA
acachloroethane	ND	(0.0408)	[1]	4.2	(0.403)	[1]	NA	NA
acachloroethane	0.113	(0.0547)	[1]	1.59	(0.54)	[1]	NA	NA
acachloroethane	ND	(0.103)	[1]	ND	(1.01)	[1]	NA	NA
acachloroethane	ND	(0.113)	[1]	ND	(1.12)	[1]	NA	NA
acachloroethane	ND	(0.14)	[1]	ND	(1.38)	[1]	NA	NA
acachloroethane	15.2 B	(0.183)	[1]	132 B	(1.8)	[1]	NA	NA
acachloroethane	ND	(0.109)	[1]	ND	(1.08)	[1]	NA	NA

## 16 - Percent Moisture (percent)

Percent moisture	20.7	(0)	[1]	24.9	(0)	[1]	5.94	(0)	[1]	16	(0)	[1]
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Compiled: 22 June 1994

() = Detection Limit [ ] = Dilution Factor ND = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to report

357

9  
E4  
KRF-E4-U0911  
9 - 11

9  
E4  
KRF-E4-U2426  
24 - 26

9  
E5  
KRF-E5-U0406  
4 - 6

9  
E5  
KRF-E5-U0608  
6 - 8

PARAMETER

3240 - Volatile Organics, cont. (ug/kg)

trans-1,2-Dichloroethene	ND	(2.28)	[1]	ND	(1810)	[1000]	ND	(2.32)	[1]	ND	(2.31)	[1]
trans-1,3-Dichloropropene	ND	(1.7)	[1]	ND	(1590)	[1000]	ND	(1.73)	[1]	ND	(1.72)	[1]

3270 - Semivolatile Organics (ug/g)

2,4-Trichlorobenzene	ND	XY (0.0665)	[5]	0.248	(0.0927)	[1]	ND	(0.0348)	[1]	ND	(0.0345)	[1]
2-Dichlorobenzene	ND	XY (0.121)	[5]	1.24	(0.0784)	[1]	ND	(0.0295)	[1]	0.045	(0.0292)	[1]
3-Dichlorobenzene	ND	XY (0.11)	[5]	2.63	(0.0477)	[1]	ND	(0.0179)	[1]	ND	(0.0177)	[1]
4-Dichlorobenzene	ND	XY (0.144)	[5]	17.9	(0.149)	[2]	ND	(0.0281)	[1]	ND	(0.0278)	[1]
4,5-Trichlorophenol	ND	XY (0.108)	[5]	ND	(0.0743)	[1]	ND	(0.028)	[1]	ND	(0.0277)	[1]
4,6-Trichlorophenol	ND	XY (0.129)	[5]	ND	(0.0535)	[1]	ND	(0.0201)	[1]	ND	(0.0199)	[1]
4-Dichlorophenol	ND	XY (0.171)	[5]	ND	(0.0239)	[1]	ND	(0.009)	[1]	ND	(0.00891)	[1]
4-Dimethylphenol	ND	XY (0.159)	[5]	ND	(0.0934)	[1]	ND	(0.0351)	[1]	ND	(0.0348)	[1]
4-Dinitrophenol	ND	XY (0.22)	[5]	ND	(0.297)	[1]	ND	(0.111)	[1]	ND	(0.11)	[1]
4-Dinitrotoluene	ND	XY (0.134)	[5]	ND	(0.0532)	[1]	ND	(0.02)	[1]	ND	(0.0198)	[1]
6-Dinitrotoluene	ND	XY (0.147)	[5]	ND	(0.0838)	[1]	ND	(0.0315)	[1]	ND	(0.0312)	[1]
Chloronaphthalene	ND	XY (0.129)	[5]	ND	(0.122)	[1]	ND	(0.0458)	[1]	ND	(0.0454)	[1]
Chlorophenol	ND	XY (0.111)	[5]	ND	(0.0717)	[1]	ND	(0.027)	[1]	ND	(0.0267)	[1]
Methylnaphthalene	ND	XY (0.114)	[5]	6.13	(0.0772)	[1]	ND	(0.029)	[1]	< DL	(0.0288)	[1]
Methylphenol	ND	XY (0.0618)	[5]	ND	(0.0673)	[1]	ND	(0.0253)	[1]	ND	(0.0251)	[1]
Nitroaniline	ND	XY (0.145)	[5]	ND	(0.122)	[1]	ND	(0.0458)	[1]	ND	(0.0454)	[1]
Nitrophenol	ND	XY (0.146)	[5]	ND	(0.0732)	[1]	ND	(0.0275)	[1]	ND	(0.0273)	[1]
3'-Dichlorobenzidine	ND	XY (0.176)	[5]	ND	(0.0571)	[1]	ND	(0.0215)	[1]	ND	(0.0213)	[1]
Nitroaniline	ND	XY (0.153)	[5]	ND	(0.0911)	[1]	ND	(0.0342)	[1]	ND	(0.0339)	[1]
6-Dinitro-2-methylphenol	ND	XY (0.193)	[5]	ND	(0.103)	[1]	ND	(0.0389)	[1]	ND	(0.0385)	[1]
Bromophenyl phenyl ether	ND	XY (0.0824)	[5]	ND	(0.0933)	[1]	ND	(0.0351)	[1]	ND	(0.0347)	[1]
Chloro-3-methylphenol	ND	XY (0.0787)	[5]	ND	(0.0704)	[1]	ND	(0.0265)	[1]	ND	(0.0262)	[1]
Chlorophenyl phenyl ether	ND	XY (0.092)	[5]	ND	(0.0608)	[1]	ND	(0.0229)	[1]	ND	(0.0226)	[1]
Methylphenol/3-Methylphenol	ND	XY (0.0717)	[5]	ND	(0.0464)	[1]	ND	(0.0174)	[1]	ND	(0.0173)	[1]
Nitroaniline	ND	XY (0.214)	[5]	ND	(0.115)	[1]	ND	(0.0434)	[1]	ND	(0.043)	[1]
Nitrophenol	ND	XY (0.228)	[5]	ND	(0.295)	[1]	ND	(0.111)	[1]	ND	(0.11)	[1]
Benaphthene	ND	XY (0.126)	[5]	ND	(0.077)	[1]	ND	(0.0289)	[1]	0.0603	(0.0287)	[1]
Benaphthylene	ND	XY (0.125)	[5]	ND	(0.0671)	[1]	ND	(0.0252)	[1]	ND	(0.025)	[1]
Chracene	< DL	XY (0.15)	[5]	< DL	(0.0623)	[1]	0.0297	(0.0234)	[1]	0.144	(0.0232)	[1]
benzo(a)anthracene	0.151	XY (0.117)	[5]	< DL	(0.0583)	[1]	0.0836	(0.0219)	[1]	0.344	(0.0217)	[1]
benzo(a)pyrene	< DL	XY (0.156)	[5]	ND	(0.0737)	[1]	0.102	(0.0277)	[1]	0.329	(0.0274)	[1]
benzo(b)fluoranthene	< DL	XY (0.207)	[5]	ND	(0.0744)	[1]	0.244	(0.028)	[1]	0.735	(0.0277)	[1]

Filed: 22 Jun 1994

( ) = Detection Limit [ ] = Dilution Factor ND = Not Detected NA = Not Applicable \* - Value considered suspect, Refer to report

9  
E5  
KRF-E5-UI012  
10 - 12

9  
E5  
KRF-E5-UI214  
12 - 14

9  
E5  
KRF-E5-UI820  
18 - 20

9  
E5  
KRF-E5-UI2022  
20 - 22

ANALYTER

1.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)  
668 (30.4)

5 - Percent Moisture (percent)  
18 (0)

[1]	739	(31.7)	[1]	105000	(1630)	[50]	43500	(1680)	[50]
[1]	21.2	(0)	[1]	23.3	(0)	[1]	25.6	(0)	[1]